INDUCTION OF LABOUR – FOLEY'S CATHETER

Vs

PROSTAGLANDIN E2GEL

Dissertation submitted to

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

In partial fulfillment of the regulations

for the award of the degree of

M.D. BRANCH – II

OBSTETRICS AND GYNAECOLOGY

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY &
GOVT. HOSPITAL FOR WOMEN & CHILDREN
MADRAS MEDICAL COLLEGE, CHENNAI – 3
THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY
CHENNAI, INDIA

MARCH 2010

CERTIFICATE

This is to certify that the dissertation titled **"INDUCTION OF LABOUR – FOLEY'S CATHETER Vs PROSTAGLANDIN E2GEL"** is the bonafide original work of **Dr. A.DAHLIA MARY,** in partial fulfillment of the requirements for M.D. Branch – II (Obstetrics and Gynaecology) Examination of the Tamilnadu DR. M.G.R Medical University to be held in MARCH 2010. The Period of study was from July 2008 to August 2009.

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DECLARATION

I, **DR. A.DAHLIA MARY,** solemnly declare that dissertation titled **"Induction of Labour – Foley's Catheter Vs Prostaglandin E2 Gel"** is a bonafide work done by me at Institute of Obstetrics and Gynaecology and Government Hospital for Women and Children, Madras Medical College, Chennai, during July 2008 to August 2009 under the guidance of **Prof. Dr. REVATHY JANAKIRAMAN, M.D., DGO., MNAMS.,** Director of Department of Obstetrics and Gynaecology, Institute of Obstetrics and Gynaecology and Government Hospital for Women and Children, Egmore, Chennai.

This dissertation is submitted to Tamilnadu Dr. M.G.R Medical University, towards partial fulfillment of requirement for the award of **M.D. Degree (Branch – II) in Obstetrics and Gynaecology – March 2010.**

Place : Chennai **(DR. A.DAHLIA MARY)**

Date :

ACKNOWLEDGEMENT

I owe my thanks to the Dean, Madras Medical College and Government General Hospital, **Dr.J.MOHANASUNDARAM, M.D., Ph.D., DNB** for allowing me to avail the facilities needed for my dissertation work.

I am grateful to **Prof. Dr.REVATHY JANAKIRAMAN, M.D., DGO., MNAMS.,** Director and Superintendent, Institute of Obstetrics and Gynaecology for permitting me to do the study and for her encouragement.

I sincerely thank **Prof. Dr.SHANTHI DINAKARAN, M.D., DGO.,** Deputy Superintendent, Institute of Obstetrics and Gynaecology for her valuable assistance and guidance.

I sincerely thankful to **Prof. Dr.SARASWATHY, M.D., DGO.,** formerly Director and Superintendent, Institute of Obstetrics and Gynaecology and I am thankful to all the Unit Chiefs for giving me valuable guidance.

I am extremely thankful to **Prof. Dr. Nirupa, M.D., DGO.,** Registrar and all my Assistant Professors for their guidance and encouragement.

I am thankful to my colleagues for their full cooperation in this study and my sincere thanks to all the patients and their family who co-operated for this study.

CONTENTS

INTRODUCTION

INTRODUCTION

Labour refers to the onset of effective uterine contractions leading to progressive effacement and dilatation of the cervix resulting in expulsion of the fetus, placenta and the membranes.

Around 20% of all deliveries are preceeded by labour induction, a proportion that has not varied dramatically over recent years. Fetal death was the only indication for labour induction centuries ago. While this is now a very rare indication with prolonged pregnancy and maternal hypertensive disorders being the major indications for the last 50 – 60 years.

Techniques for inducing labour have also changed from dietary delicacies and verbal threats giving way to physical stimulation mainly achieved by cervical stretching and amniotomy and more recently to pharmacologic manipulation using oxytocin and prostaglandins. Relaxin, antiprogestins, nitric oxide have also been explored in recent years.

Measurement of fetal fibronectin in cervical mucus, maternal serum nitrite/ nitrate concentrations, ultrasound dilineation of cervical form and electrical impedance measurements across the cervix are all being investigated.

Most methods of inducing labour before the last half century involved mechanical manipulations including Galvanism, repeated pressurized douches, extra amniotic aqua piece, tents, bougies and catheters.

A number of folkloric or old wives tales are still used today by women to encourage their labour to start. Among the more common approaches are frequent walking, vaginal intercourse, participating in heavy exercise, consumption of laxatives, spicy foods or herbal tea, nipple stimulation and administration of an enema (Schaffir 2002).

During the past 40 years, labour induction has mostly involved continuing the recognized advantages of physical manipulation with a pharmacological myometrial stimulant. Post term or prolonged pregnancy is the commonest indication in many units.

Hypertensive states constitute the second most common indication for labour induction because of anticipated maternal or fetal problems. Nowadays, oligohydramnios, GDM, PROM and anomalous fetus are other indications.

Obstetricians consider that cervical state should determine the timing of delivery. Labour induction is not without its risks for the mother and particularly for the fetus. Inadvertent delivery of a pre term baby has been largely eliminated by the widespread use of ultrasound assessment of gestation. The search for an induction method that modulates the unfavourable to favourable cervix without stimulating uterine contractions which improves the ultimate outcome of labour almost eliminating the risk to the fetus remains the Holy Grail.

AIM OF THE STUDY

AIM OF THE STUDY

- To assess the effectiveness of intracervical Foley's balloon catheter versus prostaglandin E_2gel for ripening of the cervix and inducing labour.

OBJECTIVES

- To study the effect on cervical ripening.
- To study the effect on labour induction.
- To see whether oxytocin augmentation needed.
- To see the outcome of labour.
- To assess the fetal and maternal outcome.
- To see the difference in response between primipara and multipara.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

The need to time delivery has been recognized and practised for centuries. Although the indicators have clearly changed during the past two hundred years

from a need to expel a dead fetus to preemptive action to reduce the threat to fetal or maternal health, effective and safe methods of achieving delivery must be the primary objective.

- Castor oil a potent cathartic which date back to ancient Egypt used to stimulate labour.
- Nipple stimulation as a method of cervical ripening and labour induction.
- Membrane stripping was initially suggested in 1810 by James Hamilton.
- Massage of the Uterus in 1820 by Ulsamer to induce labour.
- Egg plant parmesan, herbs oregano and Basil suggested to have stimulated uterine contractions.
- Sex to induce labour by means of the prostaglandins in semen.
- Acupuncture / Acupressure by ancient Chinese on two points – Four finger widths above the inner ankle of calf and the webbing between thumb and forefinger.

- Laminaria tent used by Wilson in 1865. They are made from a seaweed root dried. When inserted in the cervix, they gradually swell several times by absorbing moisture from the cervix. Thus, the

dilatation process is safe, gradual and painless without harm to the cervix and the cavity becomes softened and enlarged.

- ❖ Extra amniotic fluid was used to induce labour by Cohen in 1846.
- ❖ Scanzoni used a hot carbolic acid douche in 1856.
- ❖ Kraus introduced bougies, fell into disuse due to high sepsis rate.
- ❖ Schreiber in 1843 stimulated labour electrically.
- ❖ Artificial rupture of the membranes being first used by Denman in 1756 and known as the English method.
- ❖ Pitocin extracted from the posterior pituitary gland in 1906. Blair Bell described its application in the pregnant uterus in 1909. Its use for induction of labour was first reported by Theobald in 1952. In 1968, Turnbull and Anderson introduced the titration method for oxytocin administration.
- ❖ Prostaglandin first isolated from seminal fluid of monkeys, sheep and goat by Ulf Von Ehler.
- ❖ Elias corey synthesized dinoprostone in 1970. In 1971, Karim and Sharma reported the results of labour at term with the use of oral PGE_2.

In 1975, Alder and Embrey gave PGE_2 extra amniotically. In 1977, Mellour et al, Wilson gave PGE_2 intravaginally. In 1980, Hefni and Louis gave PGE_2 intracervically.

- Buccellato[1], in 2000, compared 50μg misoprostol with extra amniotic saline and gave similar outcomes.
- Karim and his colleagues in Uganda, noted that PGF2α appeared in amniotic fluid during labour.
- An interesting observation noted by Howie was that women receiving intravenous prostaglandin E2 or F2α for induction of labour exhibited oxytocin levels in the plasma similar to women in the late first stage of spontaneous labour.
- Extra amniotic saline infusion by balloon catheters was attributed to Barnes in 1863. In 1998, Hemlin and Muller reported catheter infusion to be more efficacious.

CERVICAL RIPENING

The cervix has to play a dual role in human reproduction. During pregnancy, it should be firm and closed allowing the fetus to grow in utero until

functional maturity is attained. During labour, it should soften and dilate, allowing the fetus to pass through the birth canal. The process by which the cervix becomes soft, complaint and partially dilated is termed ‘cervical ripening’. Cervical ripening is due to combination of biochemical, endocrine, mechanical and possible inflammatory events. The increasing myometrial contractility seen with advancing gestation plays a vital role in the effacement of the cervix.

Structurally, the cervix is composed of collagen, as opposed to the myometrium, which predominantly consists of smooth muscle. The cervix is predominantly composed of types I(66%) and III (33%). The firmness of the cervix in the non-pregnancy state is mainly due to the properties of these collagen fibrils, which are bound together tightly in the form of bundles. These bundles in turn are embedded in ground substance consisting of proteoglycans.

In the cervix, the main glycosaminoglycans are dermatan sulphate and chondroitin sulphate, both of which are negatively charged and hydrophobic. Hence, they repel water and are responsible for the firmness of the cervix. They facilitate the optimum orientation of the collagen fibrils, enhancing the mechanical strength of the cervix.

Cervix loses its firmness in late pregnancy and becomes soft and compliant. During labour, it further loses its elasticity, viscosity and plasticity. Towards term, the glycosaminoglycan concentration of the cervix alters and the dermatan and chondroitin sulphates are replaced by hyaluronic acid, which has different

physiochemical properties. Hyaluronic acid is hydrophilic and imbibes water. Accumulation of water within the substance of the cervix destabilizes the collagen fibrils, contributing to cervical ripening. This increase in the water content also decreases the effective concentration of collagen in the cervix, though the total content of collagen increases at term. Furthermore, the accumulation of water in between the collagen fibrils has a scattering or dispersing effect, resulting in reduced mechanical strength.

There are various enzymes which also promote collagen remodelling. Collagenase is an enzyme that breaks down collagen types I, II and III and is produced by both the fibroblasts and leucocytes. Leucocyte elastase is another enzyme that can break down elastin, collagen and proteoglycans. The levels of these enzymes are found to increase with advancing gestation and are associated with progressive decline in the concentration of cervical collagen. Prostaglandins have been shown to have a direct effect on the production of procollagenase, which is a precursor of collagenase. This may explain why the administration of intracervical prostaglandins (both PGE2 and PGF2α) produces cervical changes in women. Invitro studies have shown that prostaglandins have the capacity to increase the production of glycosaminoglycans from fibroblasts in culture.

The sex steroids, oestrogen and progesterone play a opposing role with regard to the cervix during pregnancy. Progesterone prevents cervical ripening during pregnancy. The progesterone antagonist mifepristone has been found to cause cervical ripening in women undergoing termination of pregnancy.

Concentration of relaxin in the human cervix increases towards late pregnancy and when applied locally, relaxin induced cervical ripening in most cases. Relaxin also increases the production and secretion of collagenases from the amnion. It appears that stimulation of prostaglandins during labour is its main mechanism of action.

FACTORS THAT AFFECT CERVICAL RIPENING

Factor	Mechanism of Action
a. Changes in ground substance (glycosaminoglycans)	**Increase the water content of the cervix and cause scattering and dispersion of collagen. Increase formation of immature collagen.**
b. Enzymes and inflammatory mediators	**Increase collagen breakdown and remodelling.**

CHANGES OCCURRING IN THE CERVIX AND THE MYOMETRIUM

	CERVIX	MYOMETRIUM
PRE-PREGNANCY/ EARLY PREGNANCY	**Firm**	**Quiescent**
PRELABOUR	**Ripens**	**Excitable**
LABOUR	**Effacement and Dilatation**	**Contractions**

THE MYOMETRIAL CONTRACTILITY

Myometrium is mainly composed of bundles of interlacing smooth muscle fibres with sparse connective tissue. During pregnancy, the myometrium has to relax and distend to allow the growth of the fetus in utero to attain functional

maturity before expulsion. During prelabour, the excitability of myometrium increases. Finally during labour, there are efficient, strong and progressive myometrial contractions.

The development of gap junctions which allow communication between adjacent cells is one of the earliest changes occurring during the process of prelabour. Myometrial gap junctions begin to increase before term and their number becomes significantly higher during labour and falls rapidly in the postpartum period. Oestrogen and prostaglandins induce the formation of gap junctions and progesterone inhibits it. Oxytocin does not have the ability to induce the formation of gap junctions and cannot stimulate the myometrium in the absence of gap junctions.

The fundamental process involved in all the myometrial contractions is actin-myosin interaction. Myosin is the principle protein of muscle contraction and the process is dependent on calcium. Myometrial contraction is an active process requiring energy in the form of ATP.

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NATURAL ONSET OF LABOUR

Many factors, mechanical, maternal, extrinsic as well as fetal, contribute to the onset of labour. The precise trigger and mechanism of initiation of the process of parturition however still remains elusive. In many species, activation of the fetal hypothalamic, pituitary, adrenal axis occurs and a surge in fetal cortisol level

precedes the onset of labour. Cortisol induces P450 C17 enzymes like 17α-hydroxylase in the placenta which catalyse the conversion of progesterone to androgens, which are in turn converted by placental aromatase system to estrogens. Fetal cortisol is also believed to be responsible for the rising levels of lecithin in liquor amnii, which are associated with the final maturation of the lung alveoli in preparation for extra-uterine respiration.

A fall in maternal progesterone level is a prerequisite for parturition in most mammals, which is achieved either by increased conversion of progesterone to estrogens in the placenta. Though there is no apparent fall in the maternal progesterone levels in humans, there seems to be a functional block due to the presence of an endogenous antiprogestin, which may be the fetal cortisol, as its secretion from the fetal adrenal increases markedly at the end of the pregnancy. Cortisol has also shown to compete with the action of progesterone in the regulation of corticotropin releasing hormone gene in primary cultures of human placenta, which is expressed in human placenta at the end of gestation and has been suggested to be involved in the timing of the onset of labour.

The rising oestrogen/progesterone ratio, as a result, increases the local prostaglandin production in the uterine tissues and enhances the sensitivity of the myometrium to increased expression of several uterine action proteins which include the oxytocin receptors, the prostaglandin receptors, primary gap junction protein and prostaglandin endoperoxide H synthetase. Evidence is growing that instead of an actual rise in the oxytocin and prostaglandin levels, it is probably the

increase in their receptors, which is essential and serve as the trigger for labour. Inhibition of these by specific antagonists has shown promise in inhibition of preterm labour.

CERVICAL RIPENING METHODS

Ripening agents are used to make an unfavourable cervix to a favourable one so that induction is started.

Known methods at present are:

- Breast stimulation

- Cervical dilators
    - ✓ Laminaria Tents
    - ✓ Lamicel
- Membrane stripping
- Hormonal
    - ✓ Estradiol gel
    - ✓ Relaxin gel

- Mechanical dilatation
    - ✓ Extra amniotic Foley's balloon
    - ✓ Extra amniotic Foley's with saline infusion
- Mifeprostone
- Prostaglandins

- ✓ PGE_2
  - Intracervical / intravaginal
  - Suppository
  - Oral
- ✓ PGE_1 – Oral / Vaginal

PROSTAGLANDINS

Prostaglandins are derivatives of prostanoic acid and act as local hormones. They are inactivated by a single passage through the pulmonary vascular bed. PGE_2 and $PGF_{2\alpha}$ are the ones which have significant effect on the uterus and used for induction of abortion and labour. Recently, PGE_1 or misoprostol has found to be equally effective.

An interesting observation noted by Howie was that women receiving intravenous prostaglandin E_2 or $F_{2\alpha}$ for induction of labour exhibited oxytocin levels in the plasma similar to women in the first stage of spontaneous labour.

A major drawback of intravenous prostaglandin administration was the painful phlebitis that resulted. Among PGE_2 and $PGF_{2\alpha}$, PGE_2 had less severe systemic side effects like diarrhoea and vomiting.

Oral PGE_2 had frequent gastrointestinal side effects like vomiting and diarrhoea which limited its use. Local administration of PGE_2 has overcome the problem of systemic side effects to a large extent and with improved efficacy, has now become the standard method for ripening and induction of labour. Both intravaginal as well as intracervical PGE_2 have been shown to be more successful in achieving delivery within 24 hours, the benefit being more marked when used in women with unfavourable cervix and in those with intact membranes.

Caution must be exercised when administering prostaglandins to patients with compromised cardiovascular, renal or hepatic function, asthmatics and those with raised intraocular pressure and glaucoma. Oxytocin infusion should not be started before 6 – 12 hours of PGE_2 administration to avoid hyper stimulation.

PGE_2 gel 2 mg intravaginal and 0.5 mg intracervical application were equally found to be effective in ripening the cervix.

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MECHANISM OF ACTION

A. Mechanical Methods

In practice now are

Extra amniotic Foley's catheter

Extra amniotic saline infusion

They act by the following mechanism. The Foley's catheter produces a mechanical distension of the lower uterine segment. This may lead to activation of phospholipase A leading to formation of arachidonic acid which is later converted to prostaglandins.

Limitations

Increased infection

Bleeding from the cervix

Not with ruptured membranes

B. Pharmacologic Methods

Local application of prostaglandin E_2gel increases the collagenases activity, ↓ the collagen content, increases the glycosaminoglycans like hyaluronic acid and dermatan sulphate which in turn softens the cervix and helps in effacement and dilatation. It is available in 2.5 ml. syringe and contains 0.5 mg of active drug.

Disadvantages

Hyperstimulation syndrome

Fetal distress due to that

REQUISITES PRIOR TO INDUCTION

- ✓ Preinduction scoring

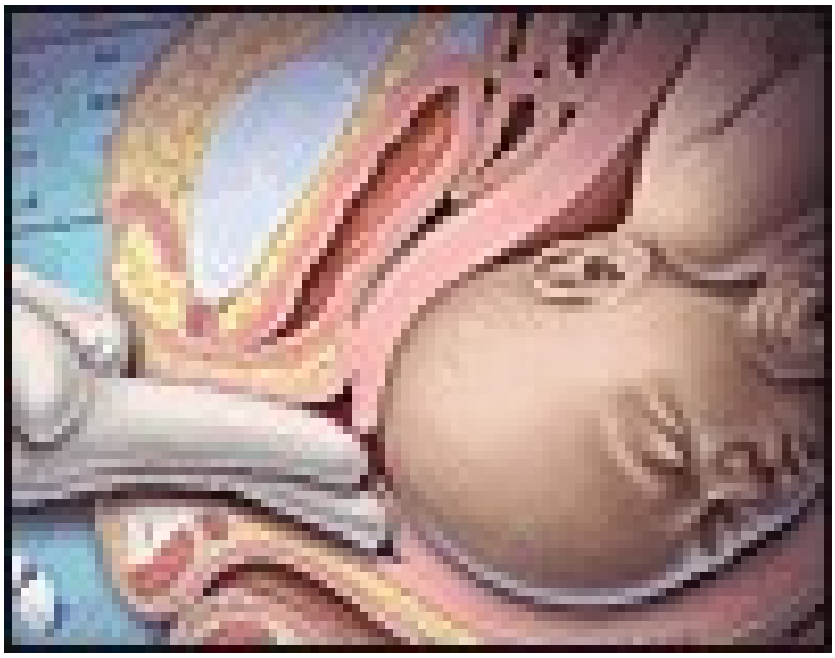
Bishop's[2] scoring system used which is very much sensitive in predicting the success of labour.

BISHOP SCORE

Factors	0	1	2	3
Effacement (%)	0 – 30%	40 – 50%	60 – 70%	80%
Dilatation (in cm)	Closed	1 – 2	3 – 4	5+
Consistency	Firm	Medium	Soft	-
Position	Posterior	Midline	Anterior	-

Station	-3	-2	-1, 0	+1, +2

Bishop score <5 taken for induction in the study.



MATERIALS AND METHODS

MATERIALS AND METHODS

The study is carried out at the Institute of Obstetrics and Gynaecology, Egmore, Chennai.

STUDY DESIGN

Prospective randomized controlled study.

SAMPLE SIZE

Each study 50

Determined by statistical analysis done using chi-square test and student ‘t’ test which were used in appropriate places.

INCLUSION CRITERIA

- Singleton pregnancies
- Cephalic presentation
- Term or post term pregnancies
- Bishop score <5
- Intact fetal membranes
- Absence of infection

EXCLUSION CRITERIA

- Malpresentation
- Multiple pregnancy
- Ruptured membranes
- Active Genital Infections
- Heart Disease
- Contracted Pelvis
- Previous scarred uterus

INDICATIONS FOR INDUCTION

- Postdated pregnancies
- Preeclampsia

- ❖ Fetal growth restriction
- ❖ Oligohydramnios

The above four indications are taken in this study.

History taking from the patient included the last menstrual period, menstrual cycle regularity, past obstetric and medical history.

Clinical examination of the patient done. Vitals are examined. Anemia, pedal edema noted. Obstetric examination of the abdomen done. After correlating the history, clinical findings and previous ultrasound findings, according to the indication, patient selection for induction is done.

After selecting the patients for study, their Bishop score was assessed by pelvic examination by evaluating the cervical consistency, effacement, position, dilatation and station of the presenting part. Major degrees of cephalopelvic disproportion ruled out.

CONTRAINDICATIONS FOR INDUCTION

- ➢ Disproportion
- ➢ Malpresentation
- ➢ Tumors occupying the pelvis
- ➢ Major degree placenta previa
- ➢ Carcinoma cervix
- ➢ Active herpes, HIV infection

- Previous classical caesarean section

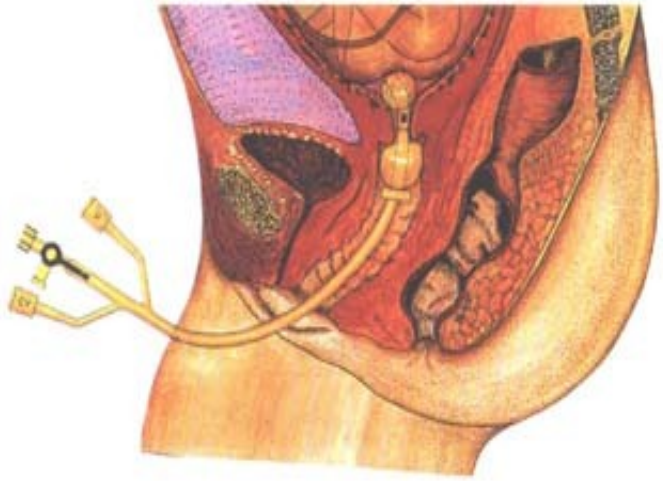
METHOD OF APPLICATION

Intracervical Foley's Catheter

Patient is placed in 'lithotomy position', perineum and vagina are cleansed with betadine solution. No.16 foley's catheter is introduced into the endocervix by direct visualization or blindly by locating the cervix with the examining fingers and guiding the catheter over the hand and fingers through the endocervix and into the potential space between the amniotic membrane and lower uterine segment. The balloon reservoir is inflated with 30 – 40 ml of distilled water.

The balloon is retracted so that it rests on the internal os. The patient examined for the progress of labour. Bishop score reassessed after six hours, after removing the Foley's catheter. Cerviprime instillation required or low amniotomy followed by oxytocin augmentation are noted. All patients received prophylactic antibiotics. Two doses of injection ampicillin 1 gm after test dose eight hours apart given.

FOLEY's CATHETER INSERTION



Prostaglandin E_2gel instillation

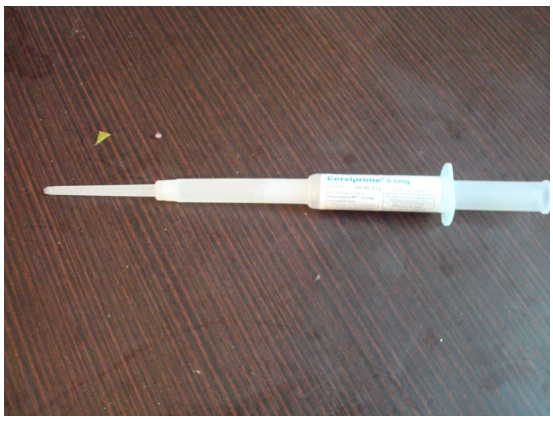
PGE_2 gel – Cerviprime gel which contains 0.5 mg of PGE_2 per 3 gm present in 2.5 ml prefilled syringe is used. Bring gel to room temperature before application. Monitor fetal heart rate and uterine activity continuously starting 15 to 30 minutes before gel introduction.

Introduce the gel into the cervix as follows

Patient in lithotomy position, perineum and vagina cleaned with betadine. If the cervix is uneffaced, use 20 mm endocervical catheters to introduce the gel into the endocervix just below the level of the internal os, care taken not to injure the membranes. Patient to remain recumbent for 30 minutes after the procedure. Maximum recommended dosage is 1.5 mg (3 doses) in 24 hours.

Bishop score assessed after six hours after the procedure. If the cervix not favourable, then a second dose of gel applied. If the cervix favourable, low amniotomy done to hasten the labour and augmentation with oxytocin done. Partogram was used to monitor the progress of labour.

End points for ripening include strong uterine contractions, a bishop score ≥8 or a change in maternal or fetal status



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Monitoring required during Induction

- Fetal heart rate
- Maternal pulse rate, temperature, blood pressure
- Frequency and duration of uterine, contractions.
- Induction – labour interval

  Interval between induction and response of uterus
- Induction – delivery interval

  Interval between induction and end of 2nd stage of labour

Follow up period – 48 – 72 hours both mother and fetus.

They are carefully watched for any puerperal or neonatal infections.

Successful cervical ripening

The definition of successful ripening was a change of four or more units in Bishop score within eight hours of starting the procedure.

Successful induction

If the patient entered the active phase of labour, effacement of 75% or more and cervical dilatation of 3 cm or more.

Primary Outcome

Improvement in the Bishop score after induction and patient getting into active phase of labour.

Secondary outcome

- Induction to delivery either vaginal or caesarean.
- Maternal and neonatal outcomes

PARTOGRAM

It is a graphic representation of the details of progress of labour together with information about fetal and maternal condition against time scale.

The components of the partogram:

1. Cervical dilatation in cm
2. Descent of the presenting part
3. Frequency and duration of uterine contractions
4. Fetal heart rate
5. Rupture of membranes and colour of amniotic fluid
6. Maternal pulse rate
7. Blood pressure
8. Urine output
9. Urine sugar
10. Drugs used and several other parameters

An alert line is drawn at the rate of expected progress that is 1 cm/hr. An action line is drawn parallel to alert line but two hours part. A normal cervicograph follows alert line or deviates to left. If labour is abnormal, then cervicograph deviates towards right or crosses the action line when definite action is needed.

OBSERVATION AND ANALYSIS

OBSERVATION AND ANALYSIS

TABLE 1

AGE DISTRIBUTION

Age in years	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
<20	3	6	6	12	9
20 - 24	34	68	26	52	60
25 - 29	10	20	15	30	25
30 - 34	3	6	3	6	6
Total	50	100	50	100	100

Table shows the distribution of patients for age. Most of the patients age group fall between 20 – 24 years. There is no significant difference in the age group between the two groups.

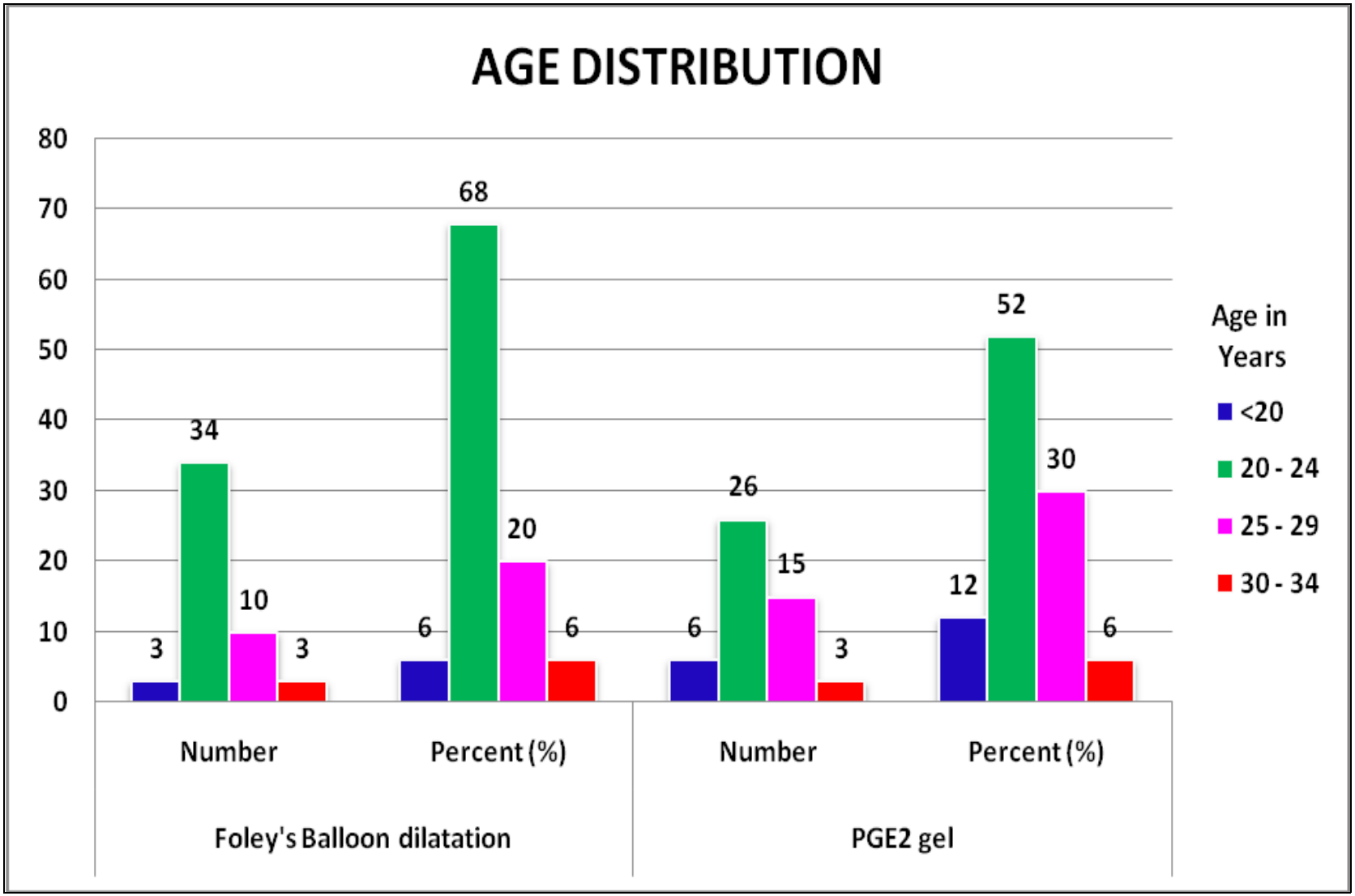
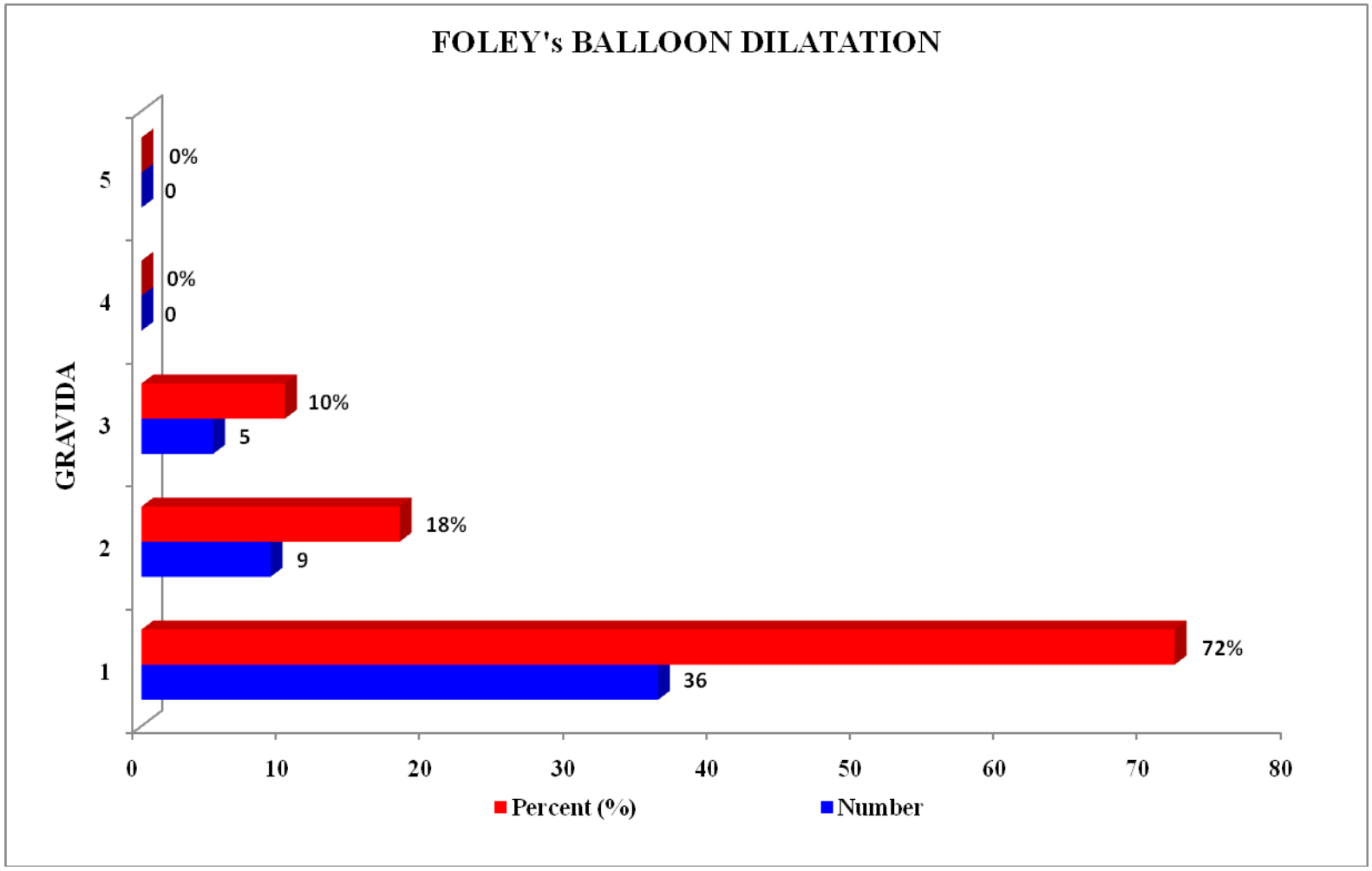

AGE DISTRIBUTION
80
70
60
50
40
30
20
10
0
3
34
10
3
6
68
20
6
6
26
15
3
12
52
30
6
Number
Percent (%)
Number
Percent (%)
Foley's Balloon dilatation
PGE2 gel
Age in Years
<20
20 - 24
25 - 29
30 - 34

TABLE 2

GRAVIDA

Gravida	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
1	36	72	36	72	72
2	9	18	8	16	17
3	5	10	4	8	9
4	-	-	1	2	1
5	-	-	1	2	1
Total	50	100	50	100	100

This is the table showing gravida distribution for Foley's balloon dilatation and prostaglandin E_2 gel. In both Foley's dilatation and PGE_2 regimen. 72% were primigravida. 28% multigravida in both Foley's and PGE_2 regimen. There is no difference in the gravida distribution between the two groups.


FOLEY's BALLOON DILATATION
GRAVIDA
5
4
3
2
1
0%
0
0%
0
10%
5
18%
9
72%
36
0
10
20
30
40
50
60
70
80
Percent (%)
Number

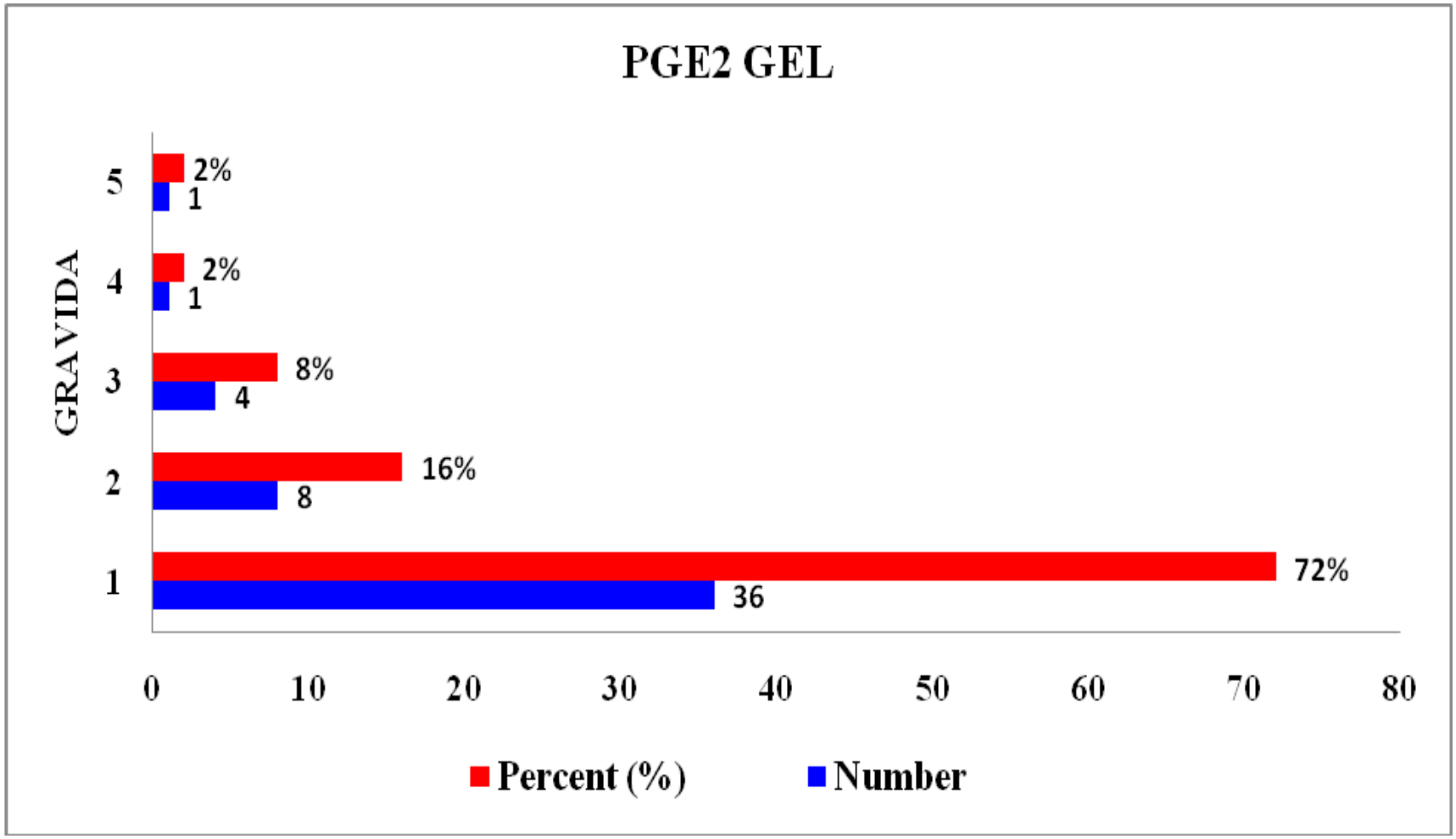

PGE2 GEL
GRAVIDA
5
4
3
2
1
2%
1
2%
1
8%
4
16%
8
72%
36
0
10
20
30
40
50
60
70
80
Percent (%)
Number

TABLE 3

GESTATIONAL AGE

Gestational age in weeks	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
37 – 40	24	48	36	72	60
>40	26	52	14	28	40
Total	50	100	50	100	100

Majority of patients in PGE_2 gel → 37 – 40 weeks of gestation (72%).

In Foley's balloon dilatation → equal distribution between 37 – 40 and >40 weeks 28%.

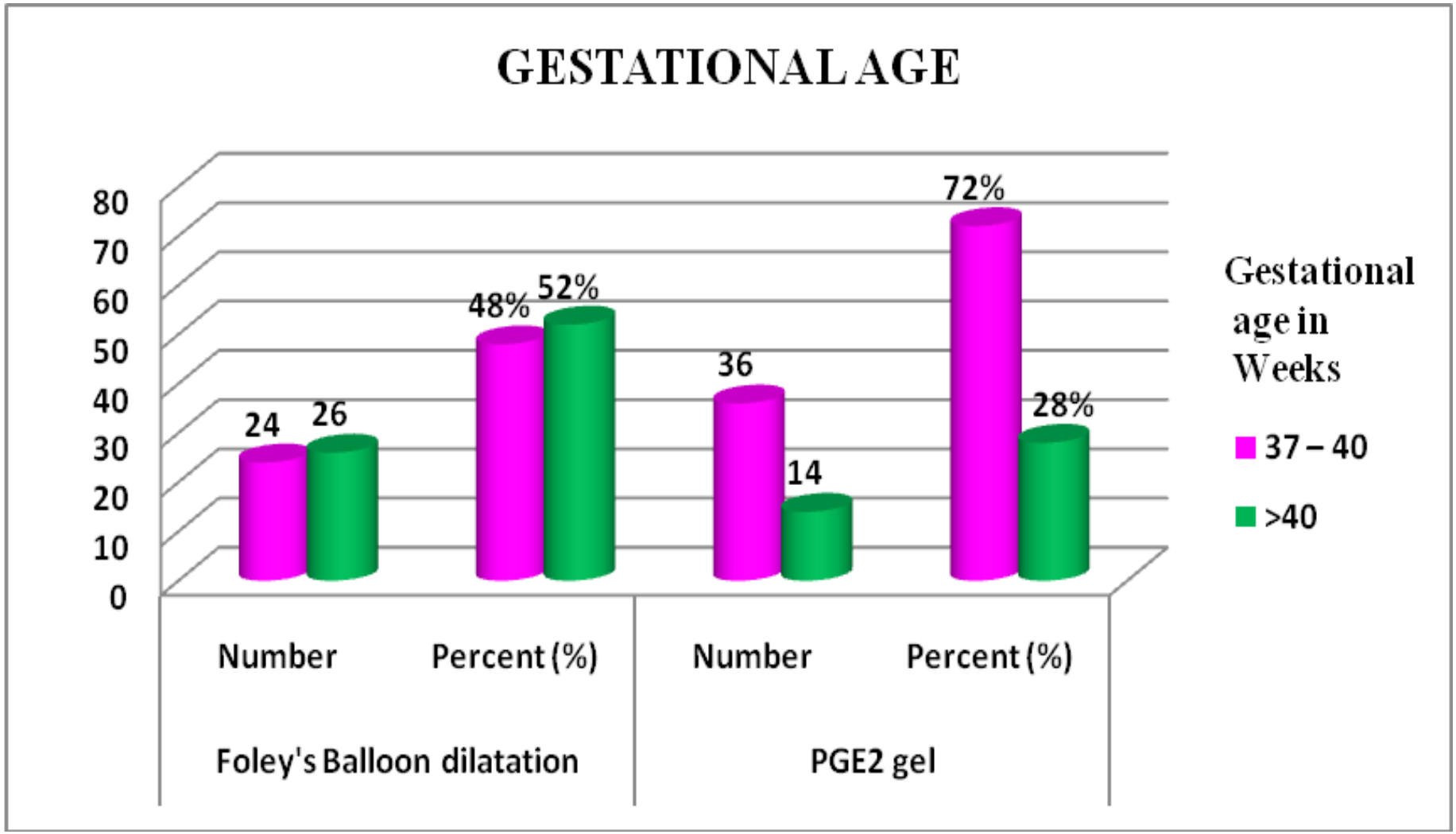

GESTATIONAL AGE
80
70
60
50
40
30
20
10
0
24
26
48%
52%
36
14
72%
28%
Number
Percent (%)
Number
Percent (%)
Foley's Balloon dilatation
PGE2 gel
Gestational age in Weeks
37 – 40
>40

TABLE 4

INDICATION FOR INDUCTION

Indication	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
Postdated	38	76	33	66	71
Preeclampsia	7	14	9	18	16
IUGR	3	6	4	8	7
Oligohydramnios	2	4	4	8	6
Total	50	100	50	100	100

Postdatism was the commonest indication in both study groups. Both groups had similar indication for induction of labour.

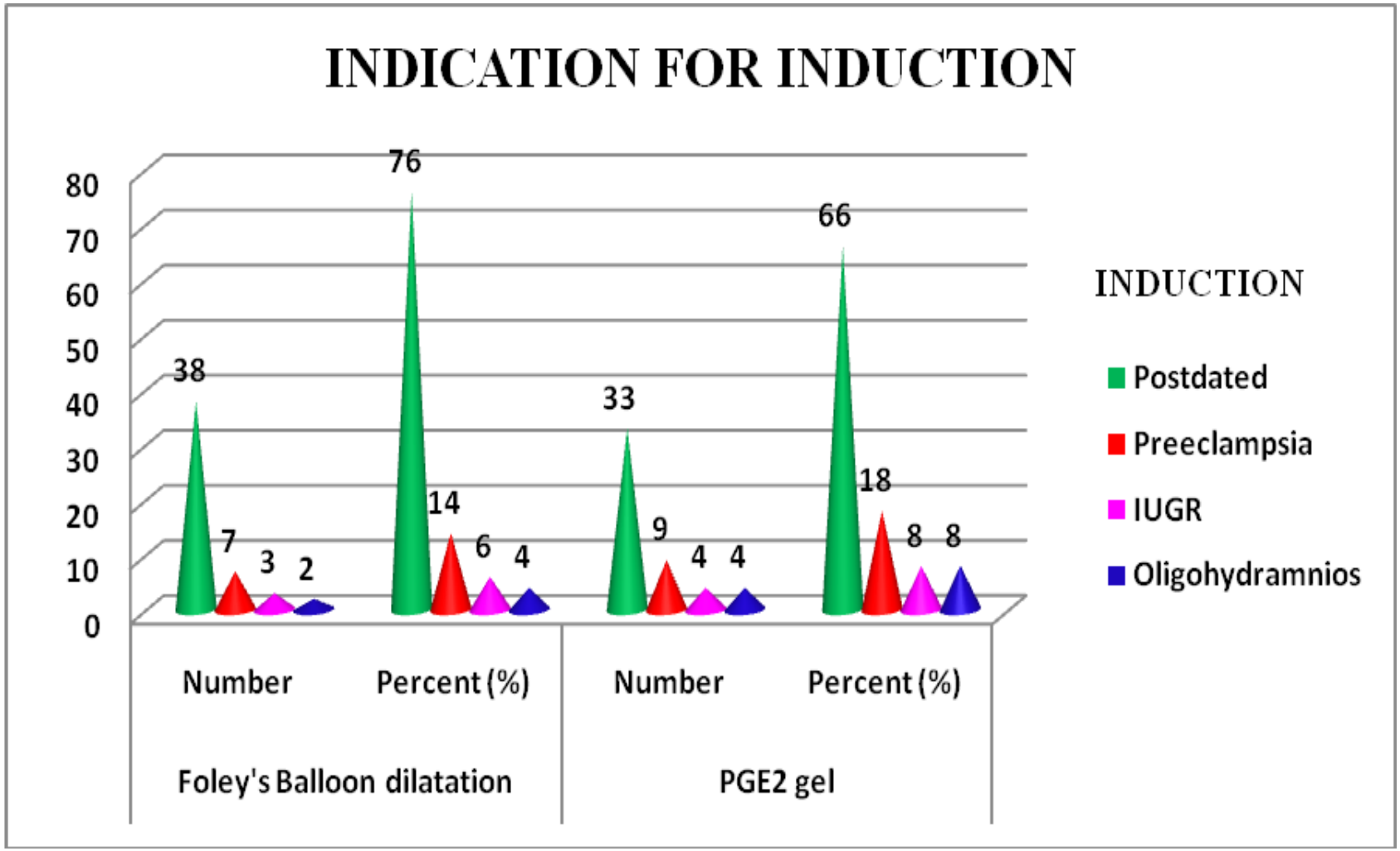

INDICATION FOR INDUCTION
80
70
60
50
40
30
20
10
0
38
7
3
2
76
14
6
4
33
9
4
4
66
18
8
8
Number
Percent (%)
Number
Percent (%)
Foley's Balloon dilatation
PGE2 gel
INDUCTION
Postdated
Preeclampsia
IUGR
Oligohydramnios

TABLE 5

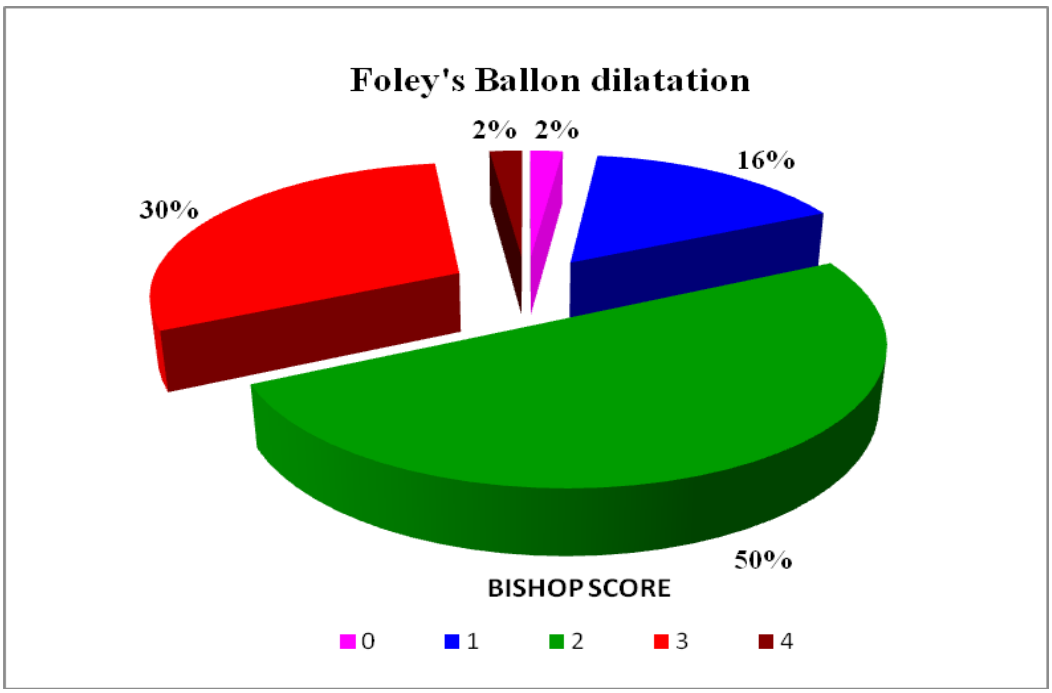
BISHOP SCORE AT '0' HOUR

Bishop Score	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
0	1	2	-	-	1
1	8	16	8	16	16
2	25	50	23	46	48
3	15	30	16	32	31
4	1	2	3	6	4
Total	50	100	50	100	100

Both the groups were started with same Bishop score. Bishop score of <5 taken as indication for induction. In both groups, maximum patients had a Bishop score of 2 or 3. In Foley's balloon dilatation, 50% had a Bishop score of 2. In PGE_2 gel regimen, 46% had Bishop score 2. In Foley's balloon dilatation, 30% had a Bishop score of 3 and in PGE2 gel regimen, 32% had a Bishop score of 3.

No significant difference in the Bishop score at '0' hours between the two groups. Hence, both the groups started the induction with similar Bishop score.

BISHOP SCORE AT '0' HOUR



BISHOP SCORE AT '0' HOUR

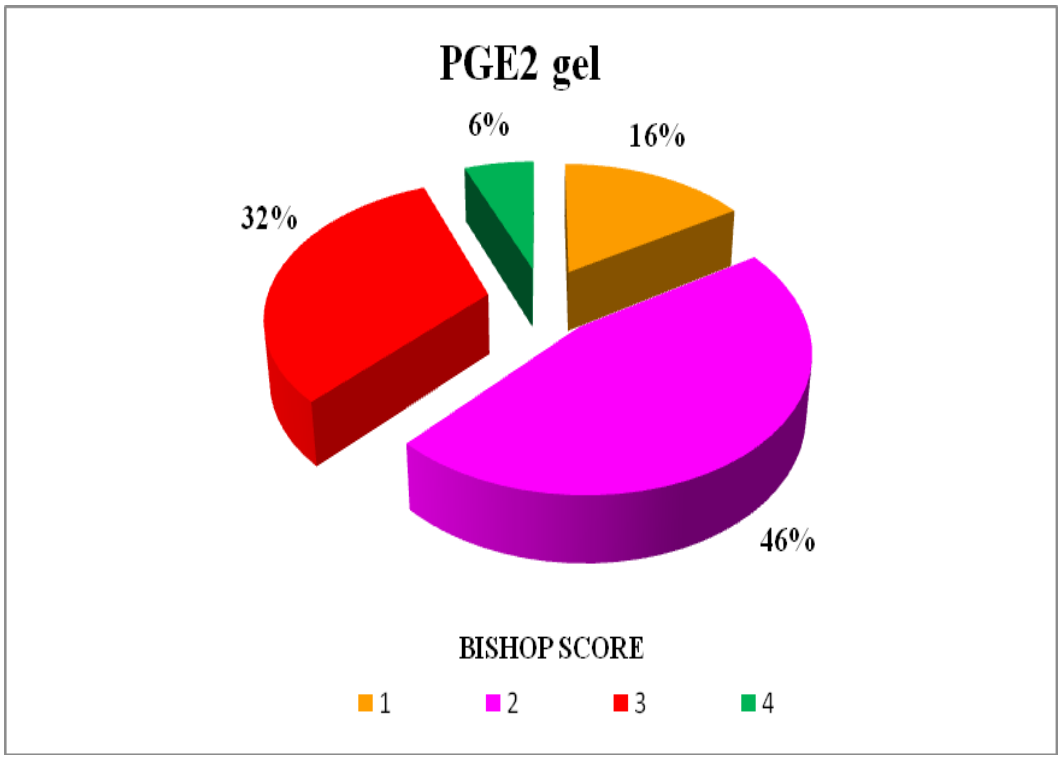
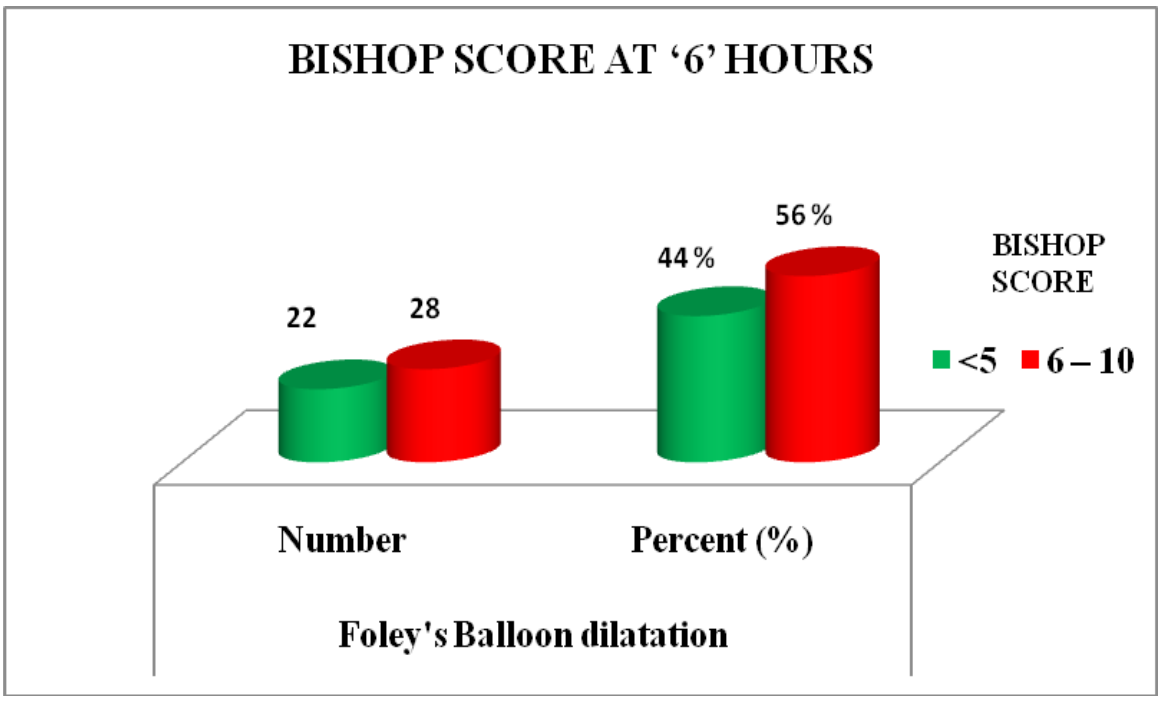


TABLE 6

BISHOP SCORE AT '6' HOURS

Bishop Score	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
<5	22	44	12	24	34
6 – 10	28	56	38	76	66
>10	-	-	-	-	-
Total	50	100	50	100	100
Mean	6		7.3		P<0.05

Table showing Bishop Score at 6 hours for both groups. 76% of pregnant women in PGE_2 gel regimen had favourable Bishop score within 6 hrs. Only 56% of pregnant women in Foley's balloon dilatation had favourable Bishop score within 6 hours. There is a statistically significant difference in the Bishop score between both groups.


BISHOP SCORE AT '6' HOURS
22
28
44 %
56 %
BISHOP SCORE
<5
6 – 10
Number
Percent (%)
Foley's Balloon dilatation

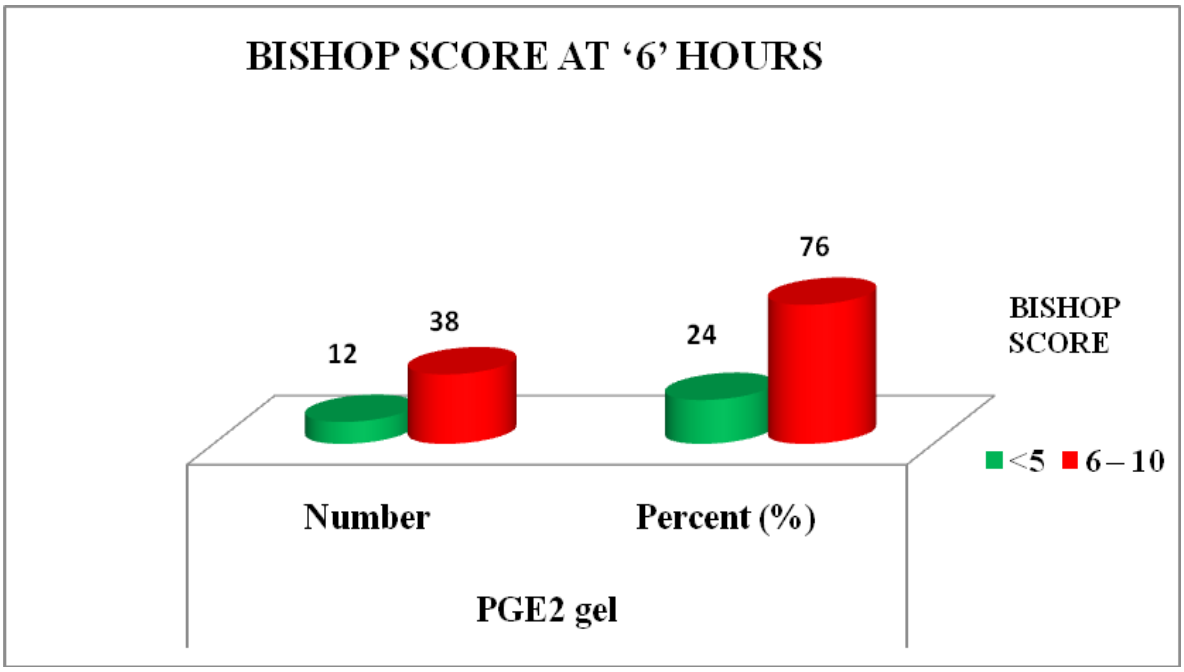
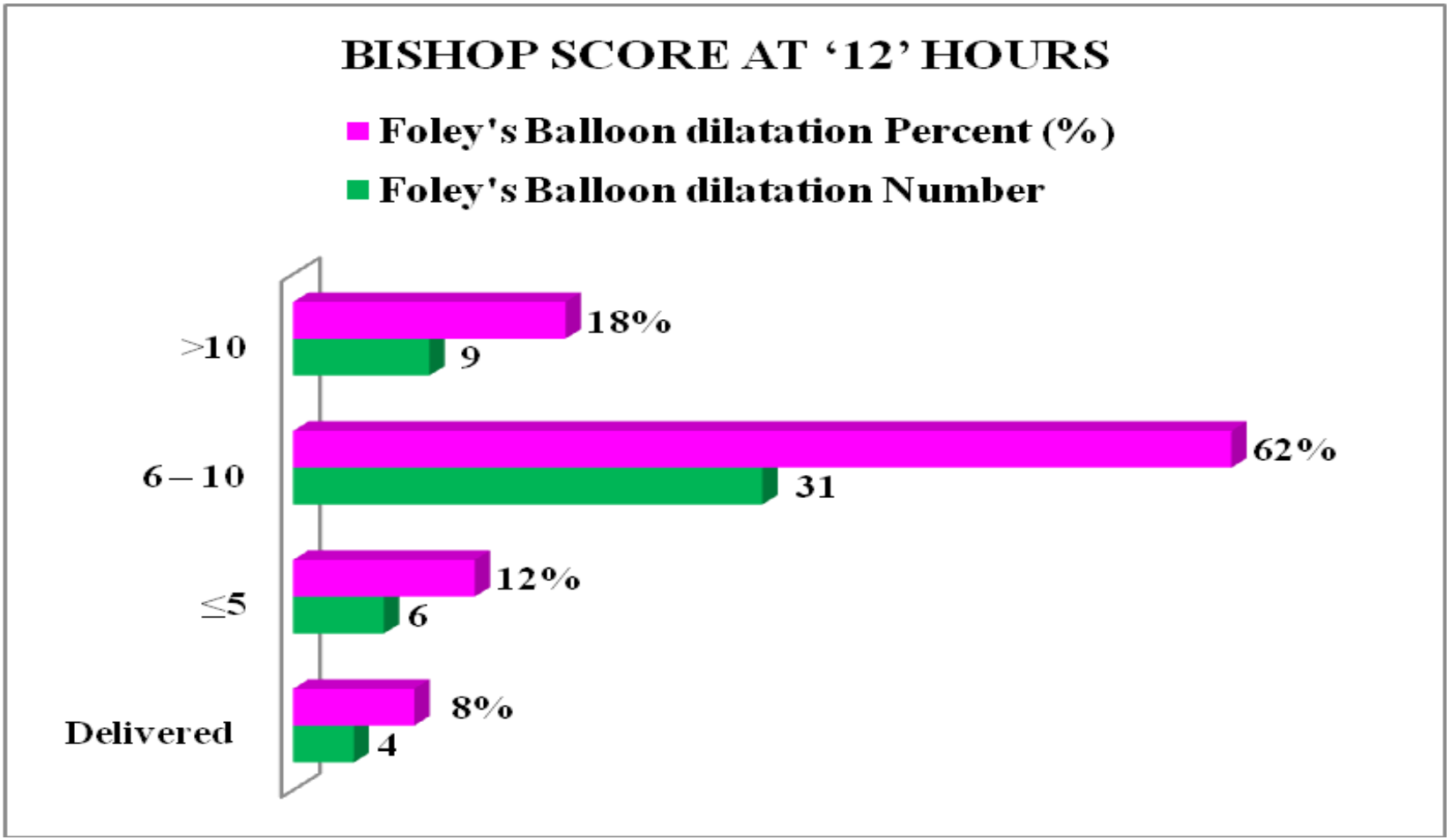

BISHOP SCORE AT '6' HOURS
12
38
24
76
BISHOP SCORE
<5
6 – 10
Number
Percent (%)
PGE2 gel

TABLE 7

BISHOP SCORE AT '12' HOURS

Bishop Score	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
Delivered	4	8	26	52	30
≤5	6	12	-	-	6
6 – 10	31	62	15	30	46
>10	9	18	9	18	18
Total	50	100	50	100	100
Mean	8.6		9.42		P<0.05

52% of patients in the PGE_2 gel delivered within 12 hours. 62% of patients in Foley's balloon dilatation had a favourable Bishop score at 12 hours. There is a statistically significant difference in the Bishop score in the PGE_2 gel compared to Foley's balloon dilatation.


BISHOP SCORE AT '12' HOURS
Foley's Balloon dilatation Percent (%)
Foley's Balloon dilatation Number
>10
6 – 10
≤5
Delivered
18%
9
62%
31
12%
6
8%
4

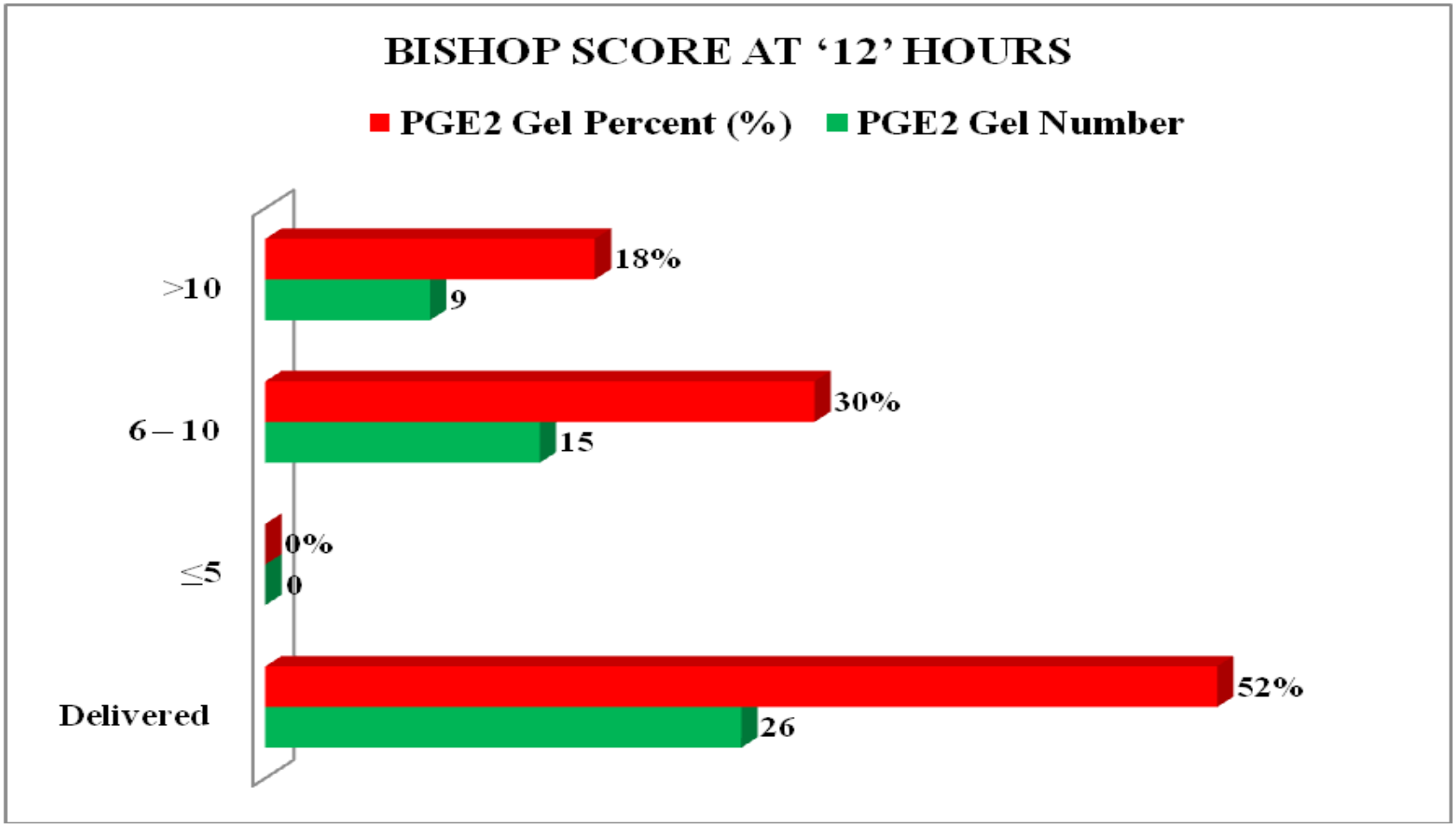

BISHOP SCORE AT '12' HOURS
PGE2 Gel Percent (%)
PGE2 Gel Number
>10
18%
9
6 – 10
30%
15
≤5
0%
0
Delivered
52%
26

TABLE 8

MEAN BISHOP SCORE

Bishop Score	Foley's Balloon dilatation		PGE2 gel	
	Primi	Multi	Primi	Multi
0 Hours	2.1	2.4	2.11	2.71
Six hours	5.7	6.7	6.8	8.4
Twelve hours	8.2	9.8	9.3	10
Eighteen Hours	11	10.8	11.8	0

P<0.05

Table shows the Mean Bishop Score at 0,6,12,18 hours in both groups. The mean Bishop Score at '0' hours is statistically not significant. The mean Bishop score at 6 hours was 5.7 hours in primis in the Foley's group when compared to the PGE_2 gel group where the mean Bishop score was 6.8 hours. Similarly, the mean Bishop Score at 12 hours was 8.2 in primis in the Foley's group when compared to the PGE_2 gel group where the mean Bishop score was 9.3. There is a statistically significant difference in the mean Bishop score at 6 and 12 hours in the PGE_2 compared to the Foley's group. The mean change in the score also significant in both nullipara and multipara in the PGE_2 gel group compared to the Foley's balloon dilatation.

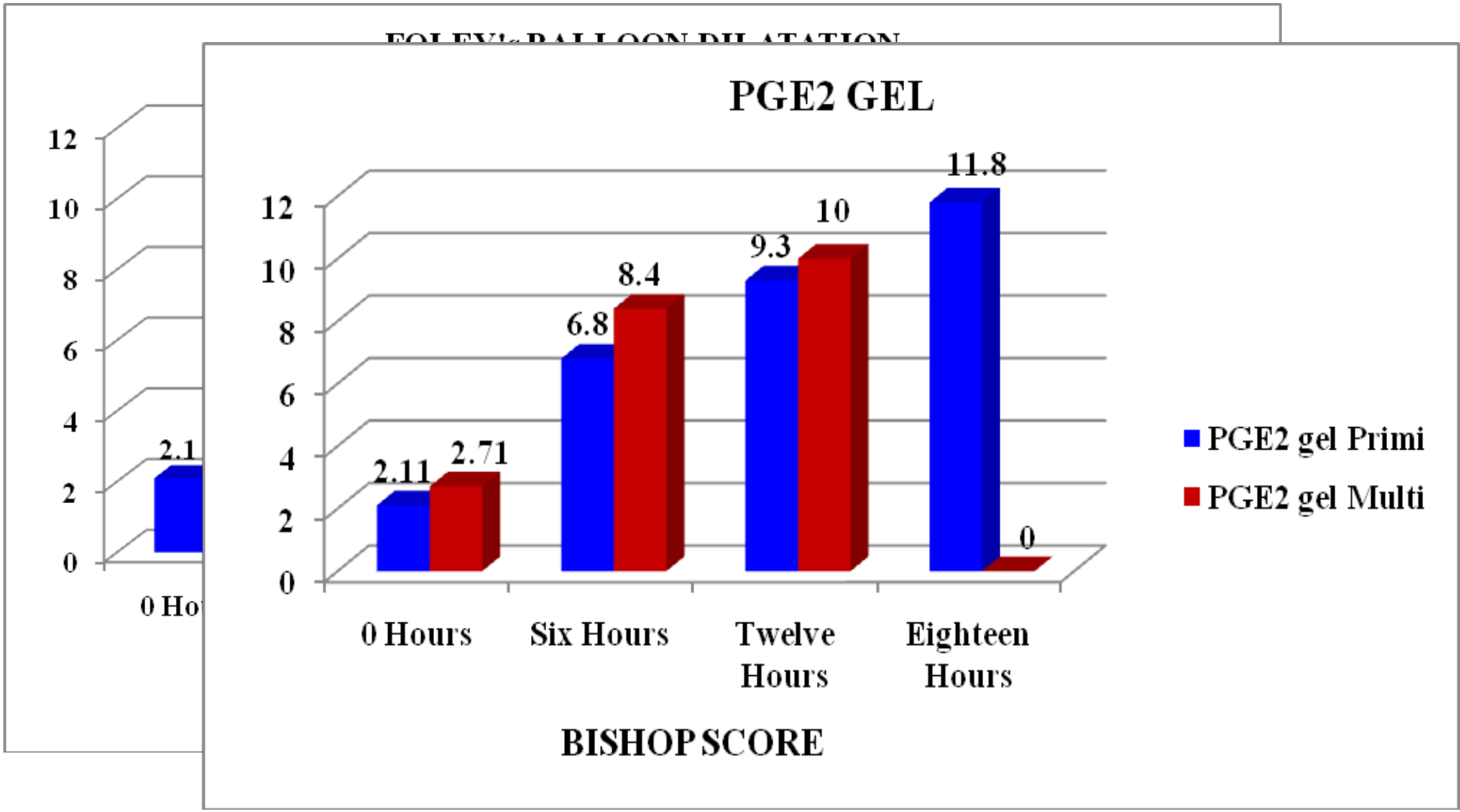
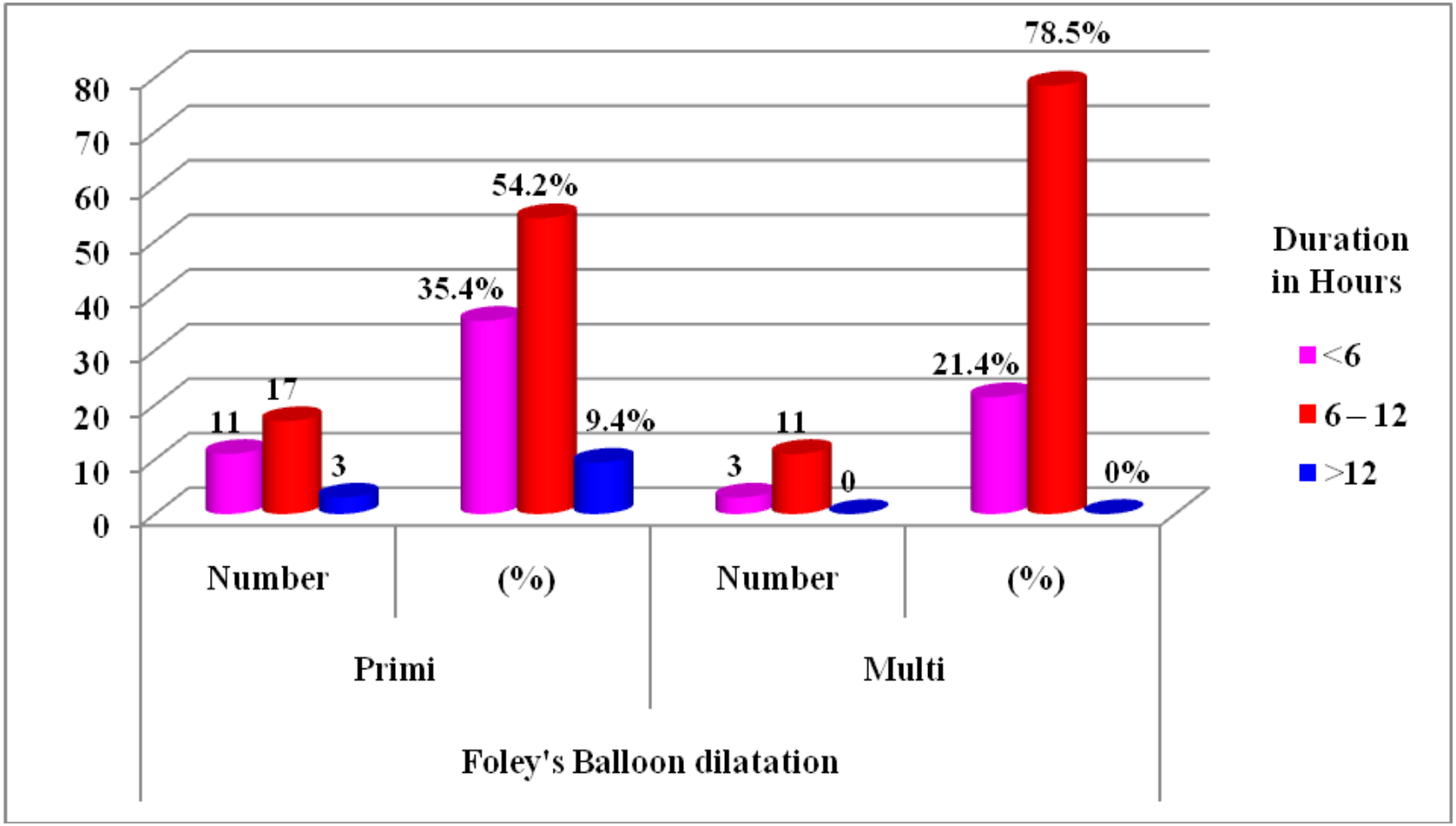

12
10
8
6
4
2
0
2.1
0 Ho
PGE2 GEL
12
10
8
6
4
2
0
2.11
2.71
6.8
8.4
9.3
10
11.8
0
0 Hours
Six Hours
Twelve Hours
Eighteen Hours
BISHOP SCORE
PGE2 gel Primi
PGE2 gel Multi

TABLE 9

INDUCTION TO ACTIVE LABOUR INTERVAL

Duration in hours	Foley's Balloon dilatation				PGE2 gel			
	Primi		Multi		Primi		Multi	
	Number	(%)	Number	(%)	Number	%	Number	%
<6	11	35.4	3	21.4	15	41.66	10	28.58
6 – 12	17	54.2	11	78.5	20	55.55	4	71.42
>12	3	9.4	-	-	1	2.67	-	-
Total	31	100	14	100	36	100	14	100

Table showing the induction to active labour interval. In Foley's balloon dilataion, 35% of primi and 21% of multi established labour within 6 hours. 54% of primi and 78% of multi within 12 hours 9% crossed 12 hours. In PGE_2 gel regimen. 41% of primi and 28% of multi established labour within 6 hours. 55% of primi and 71% of multi established labour within 12 hours. Only 2% crossed 12 hours.


80
70
60
50
40
30
20
10
0
11
17
3
35.4%
54.2%
9.4%
3
11
0
21.4%
78.5%
0%
Number
(%)
Number
(%)
Primi
Multi
Foley's Balloon dilatation
Duration in Hours
<6
6 – 12
>12

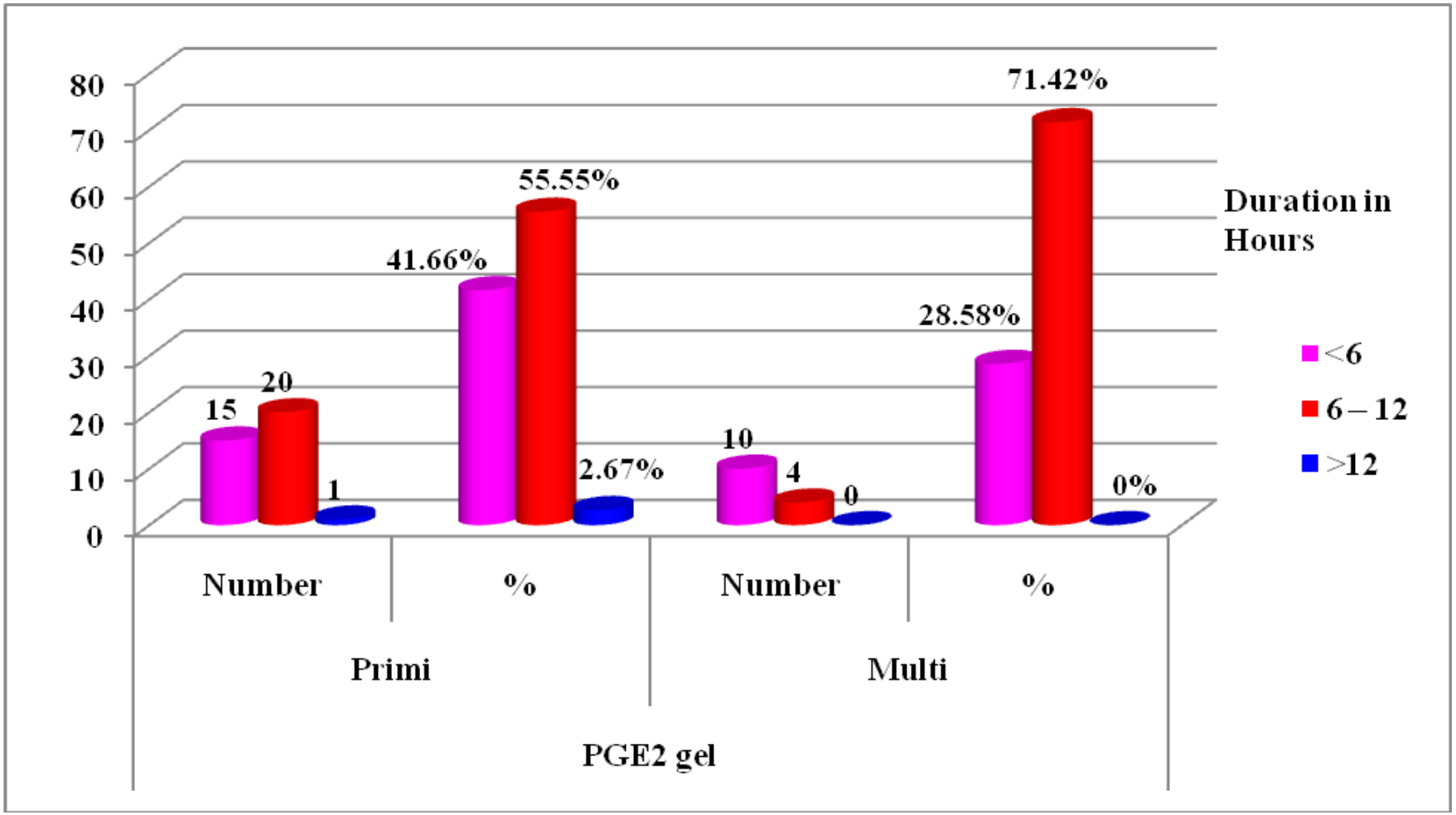

80
70
60
50
40
30
20
10
0
15
20
1
41.66%
55.55%
2.67%
10
4
0
28.58%
71.42%
0%
Number
%
Number
%
Primi
Multi
PGE2 gel
Duration in Hours
<6
6 – 12
>12

TABLE 10

MEAN INDUCTION TO ACTIVE LABOUR INTERVAL

	Foley's Balloon dilatation		PGE2 gel	
	Primi	Multi	Primi	Multi
Induction labour interval	7.5	6.6	6.5	5.2

P<0.05

The mean induction active labour interval in primigravida with Foley's balloon dilatation was 7.5 hours. The mean induction to active labour interval in primigravida with PGE2 gel group was 6.6 hours.

The mean induction active labour interval in multipara with Foley's balloon dilatation was 6.5 hours. The mean induction active labour interval in multipara with PGE2 gel group was 5.2 hours. The difference between the two groups using the't' test is statistically significant.

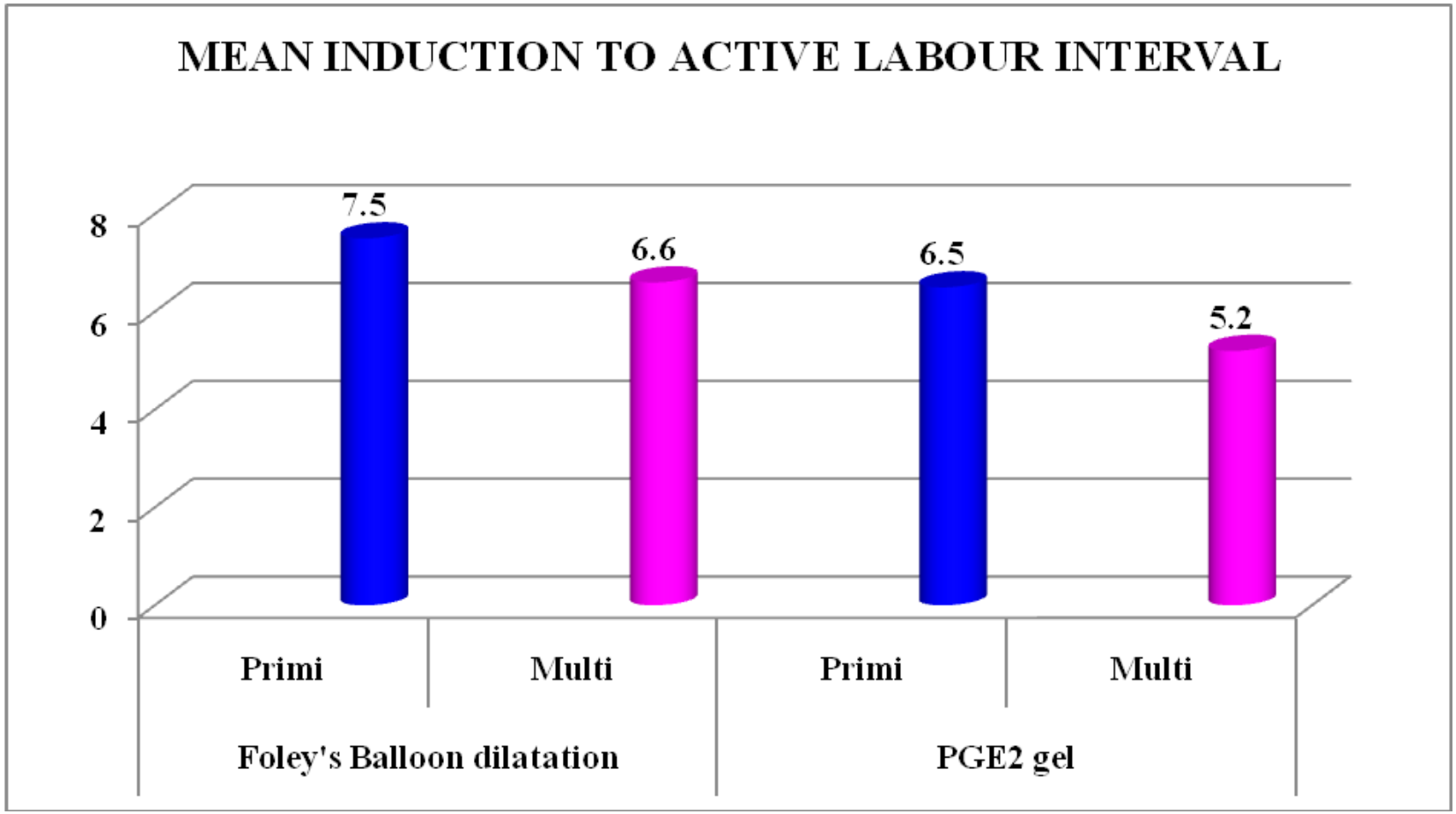

MEAN INDUCTION TO ACTIVE LABOUR INTERVAL
8
6
4
2
0
7.5
6.6
6.5
5.2
Primi
Multi
Primi
Multi
Foley's Balloon dilatation
PGE2 gel

TABLE 11

INDUCTION DELIVERY INTERVAL

Duration in hours	Foley's Balloon dilatation				PGE2 gel			
	Primi		Multi		Primi		Multi	
	No	(%)	No	(%)	No	%	No	%
6 – 12	17	47.22	7	50	22	61.11	12	85.72
12 – 24	19	52.78	7	50	14	38.89	2	14.28
Total	36	100	14	100	36	100	14	100

Table showing the Induction Delivery interval in both groups. In PGE_2 gel regimen, 61% of primi and 85% of multi delivered with 12 hours. In Foley's balloon dilatation, 47% of primi and 50% of multi delivered within 12 hours.

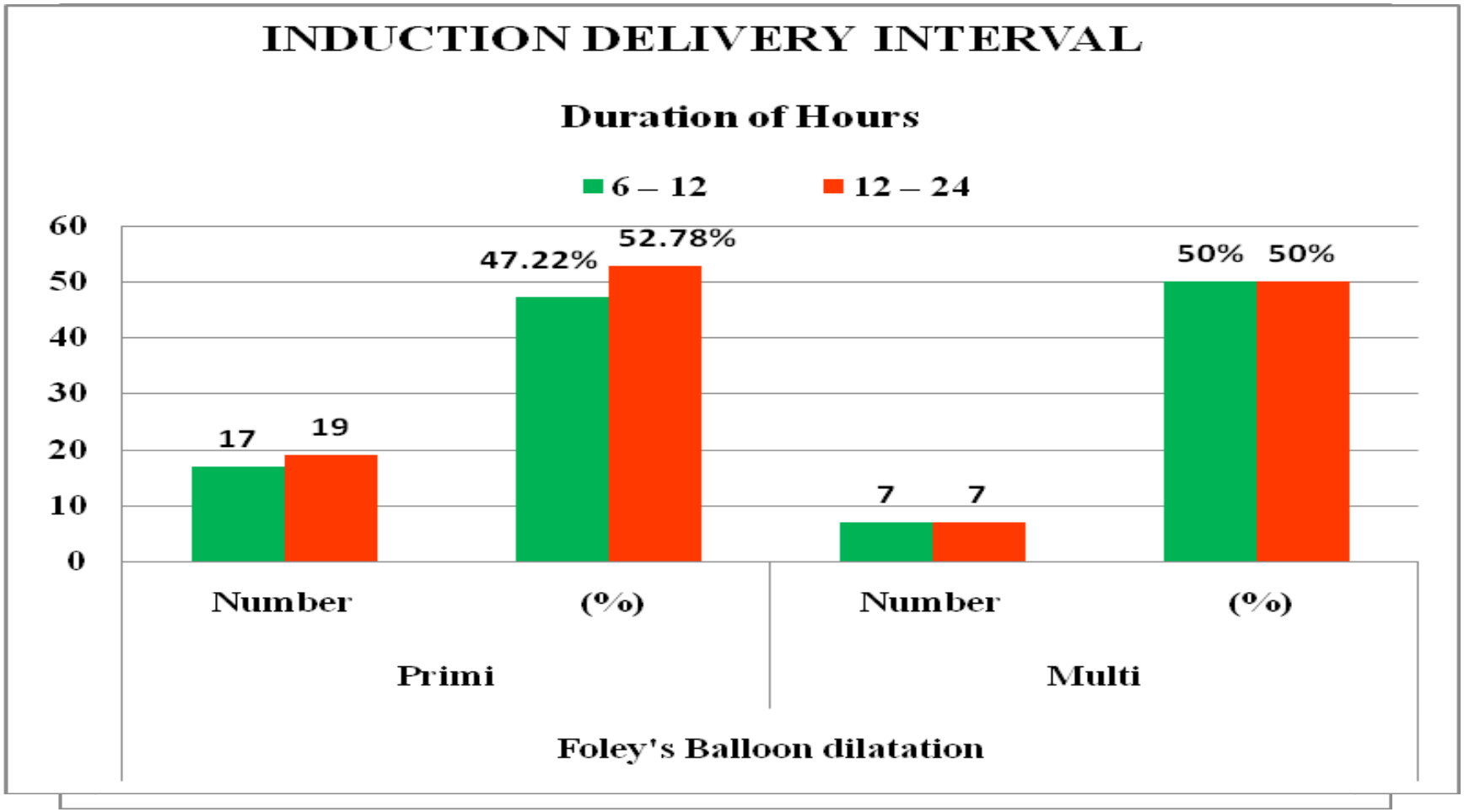

INDUCTION DELIVERY INTERVAL
Duration of Hours
6 – 12
12 – 24
60
50
40
30
20
10
0
17
19
47.22%
52.78%
7
7
50%
50%
Number
(%)
Number
(%)
Primi
Multi
Foley's Balloon dilatation

TABLE 12

MEAN INDUCTION DELIVERY INTERVAL

	Foley's Balloon dilatation		PGE2 gel	
	Primi	Multi	Primi	Multi
Induction Delivery interval in hours	13	13.4	11.7	9.9

P<0.05

The mean induction delivery interval in primigravida with Foley's balloon dilatation was 13 hours. The mean induction delivery interval in primigravida with PGE2 gel group was 13.4 hours.

The mean induction delivery interval in multigravida with Foley's balloon dilatation was 11.7 hours. The mean induction delivery interval in multi with PGE2 gel group was 9.9 hours. The difference between the two groups using the 't' test is statistically significant.

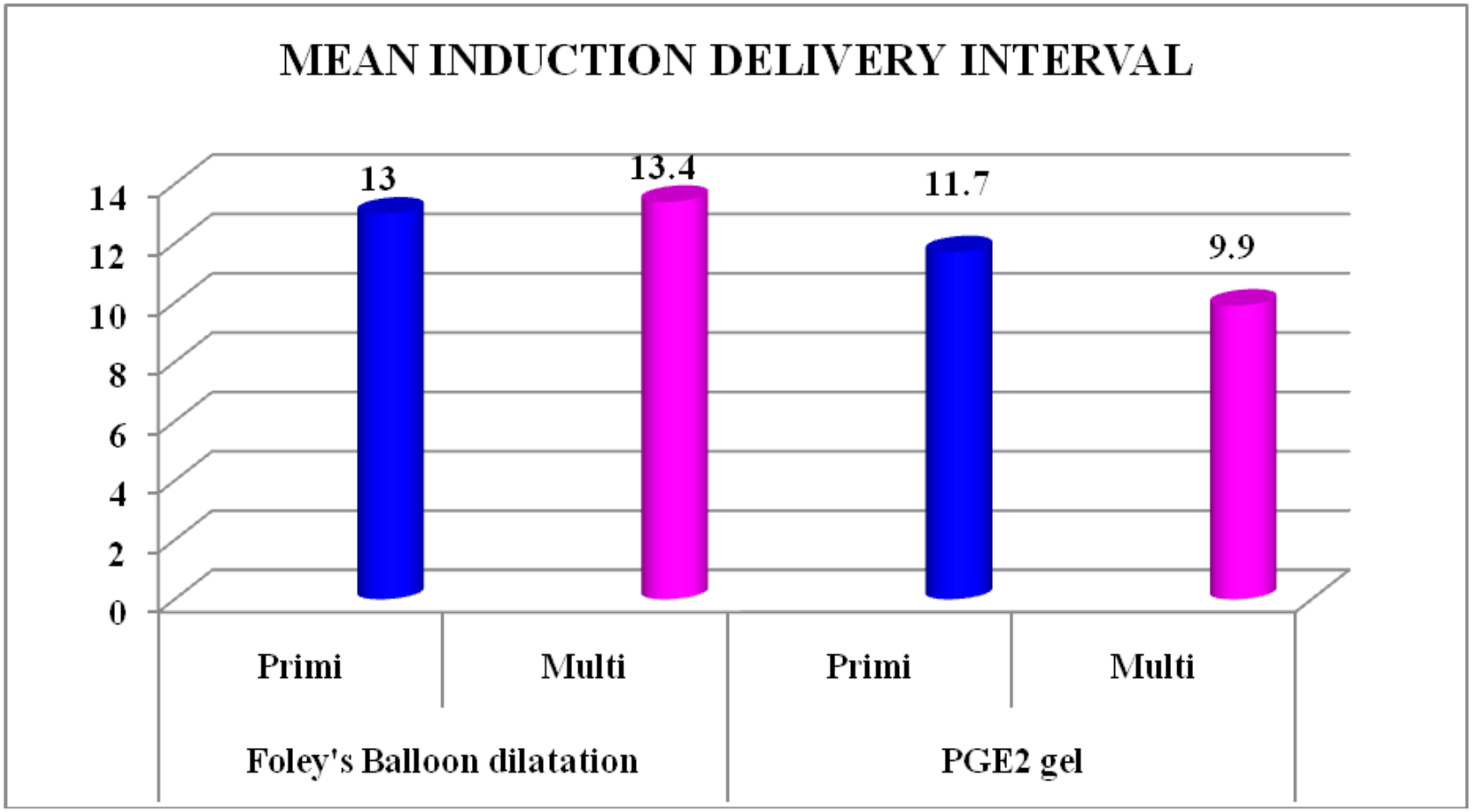

MEAN INDUCTION DELIVERY INTERVAL
14
12
10
8
6
4
2
0
13
13.4
11.7
9.9
Primi
Multi
Primi
Multi
Foley's Balloon dilatation
PGE2 gel

TABLE 13

PATIENTS REQUIRING REINSTILLATION WITH PGE_2

PGE_2 gel	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
Not used	31	62	37	74	68
Used	19	38	13	26	32
Total	50	100	50	100	100

Table showing higher use of 2nd method of induction by PGE2 in Foley's balloon dilatation than PGE_2 gel group.

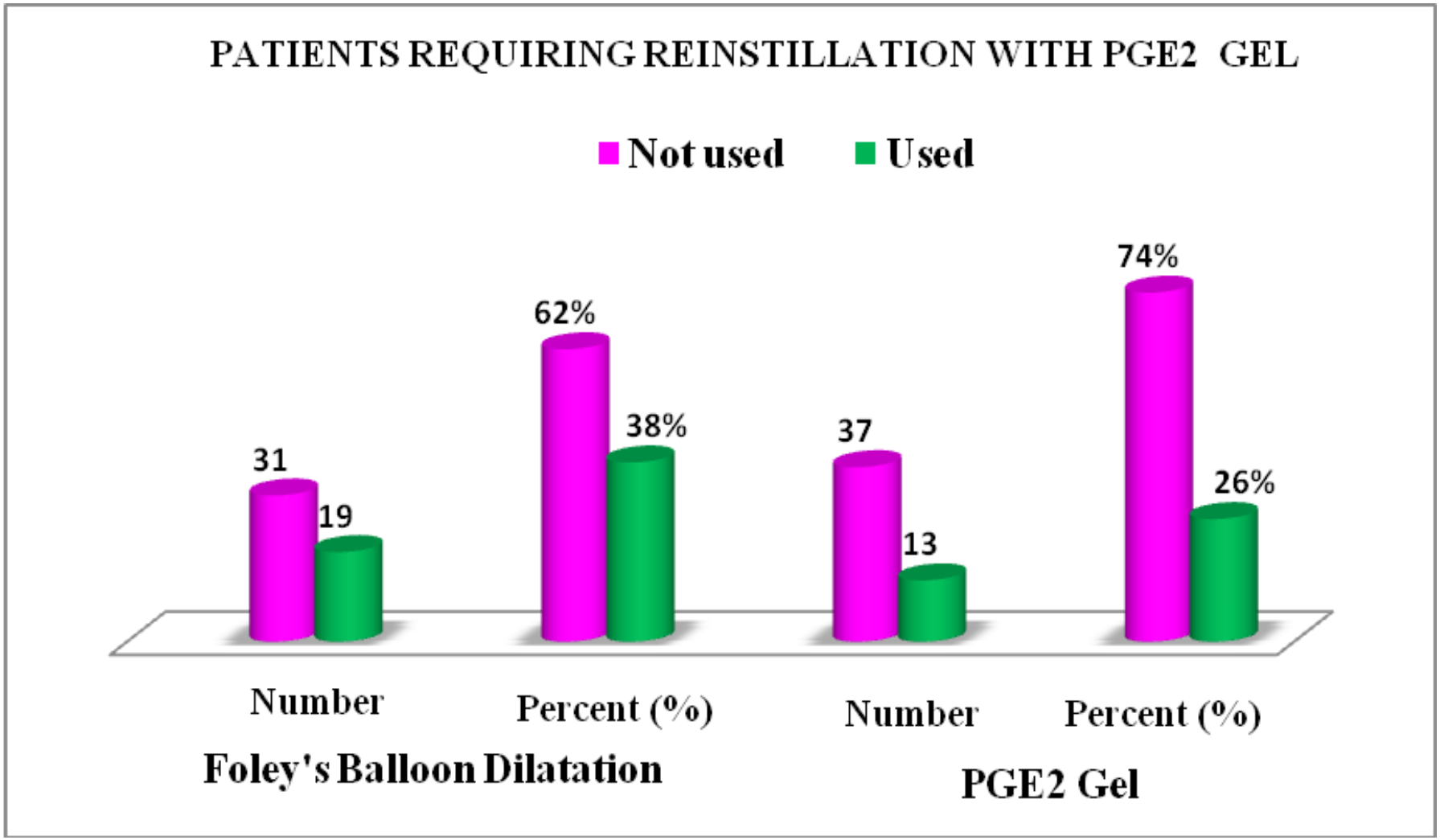

PATIENTS REQUIRING REINSTILLATION WITH PGE2 GEL
Not used
Used
31
19
62%
38%
37
13
74%
26%
Number
Percent (%)
Number
Percent (%)
Foley's Balloon Dilatation
PGE2 Gel

TABLE 14

PATIENTS REQUIRING OXYTOCIN FOR AUGMENTATION

Oxytoxin	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
Not used	11	22	32	64	43
Used	39	78	18	36	57
Total	50	100	50	100	100

P<0.05

Table shows that Oxytocin augmentation requirement is more 78% in Foley's balloon dilatation than PGE_2 gel regimen where it is only 36%. The difference is statistically significant using chi-square test.

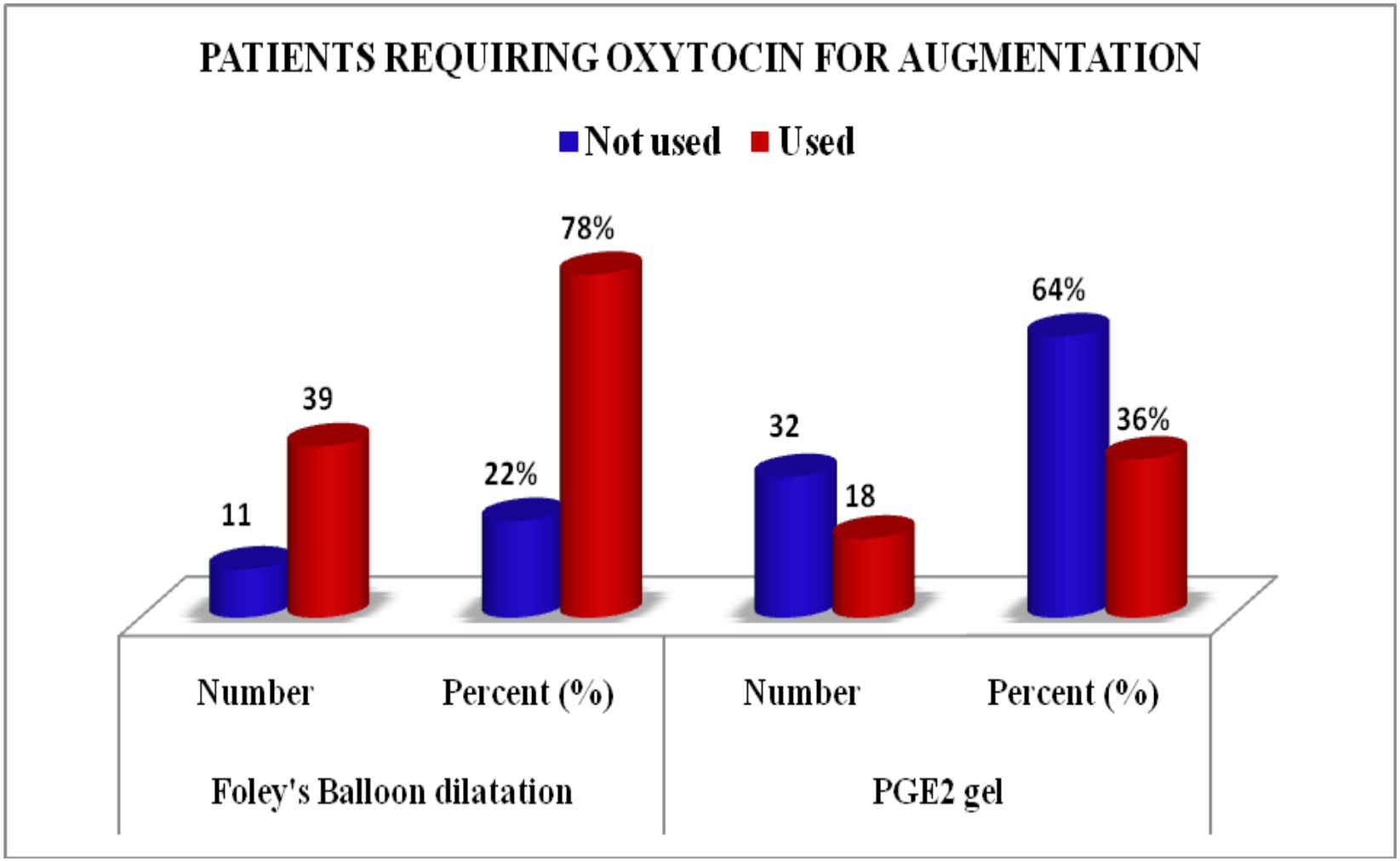

PATIENTS REQUIRING OXYTOCIN FOR AUGMENTATION
Not used
Used
11
39
22%
78%
32
18
64%
36%
Number
Percent (%)
Number
Percent (%)
Foley's Balloon dilatation
PGE2 gel

TABLE 15

MODE OF DELIVERY

Mode of Delivery	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
Labour natural	28	56	35	70	63
LSCS	16	32	7	14	23
Forceps	6	12	8	16	14
Total	50	100	50	100	100

P<0.05

70% delivered by labour natural in PGE_2 gel group, only 56% delivered labour natural in Foley's balloon dilatation. 32% LSCS rate in Foley's balloon dilatation, whereas only 14% in PGE_2 gel regimen. There is statistically significant difference in the mode of delivery between the two groups using chi-square test.

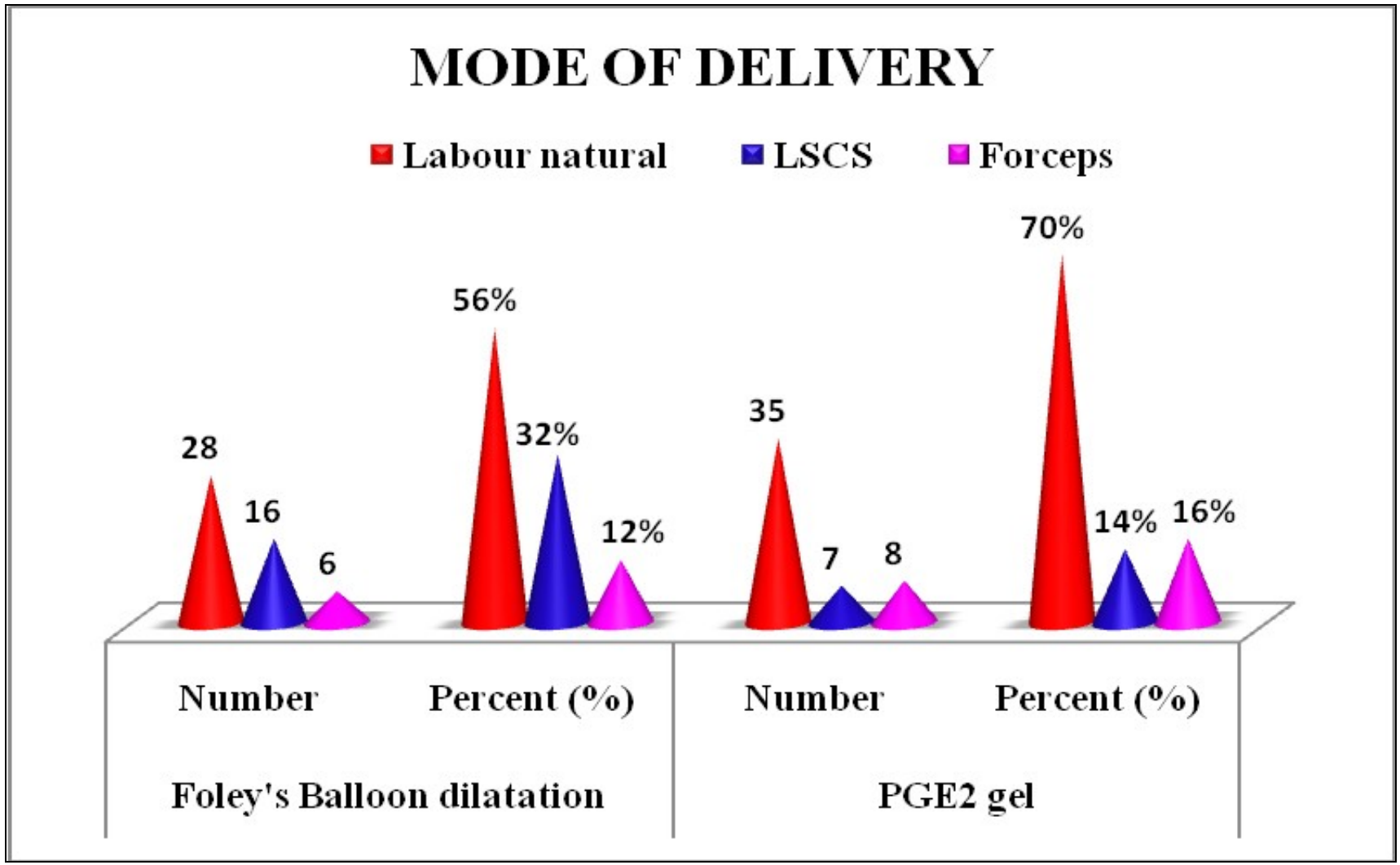

MODE OF DELIVERY
Labour natural
LSCS
Forceps
28
16
6
56%
32%
12%
35
7
8
70%
14%
16%
Number
Percent (%)
Number
Percent (%)
Foley's Balloon dilatation
PGE2 gel

TABLE 16

INDICATIONS FOR CAESAREAN SECTION

Indications	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
Fetal Distress	6	37.50	4	57.10	10
Failed Induction	7	43.75	2	28.52	9
CPD	3	18.75	1	14.38	4
Others	-	-	-	-	-
Total	16	100	7	100	23

Caesarean section rate being higher in Foley's group, the most common indication being failed induction, next comes the fetal distress.

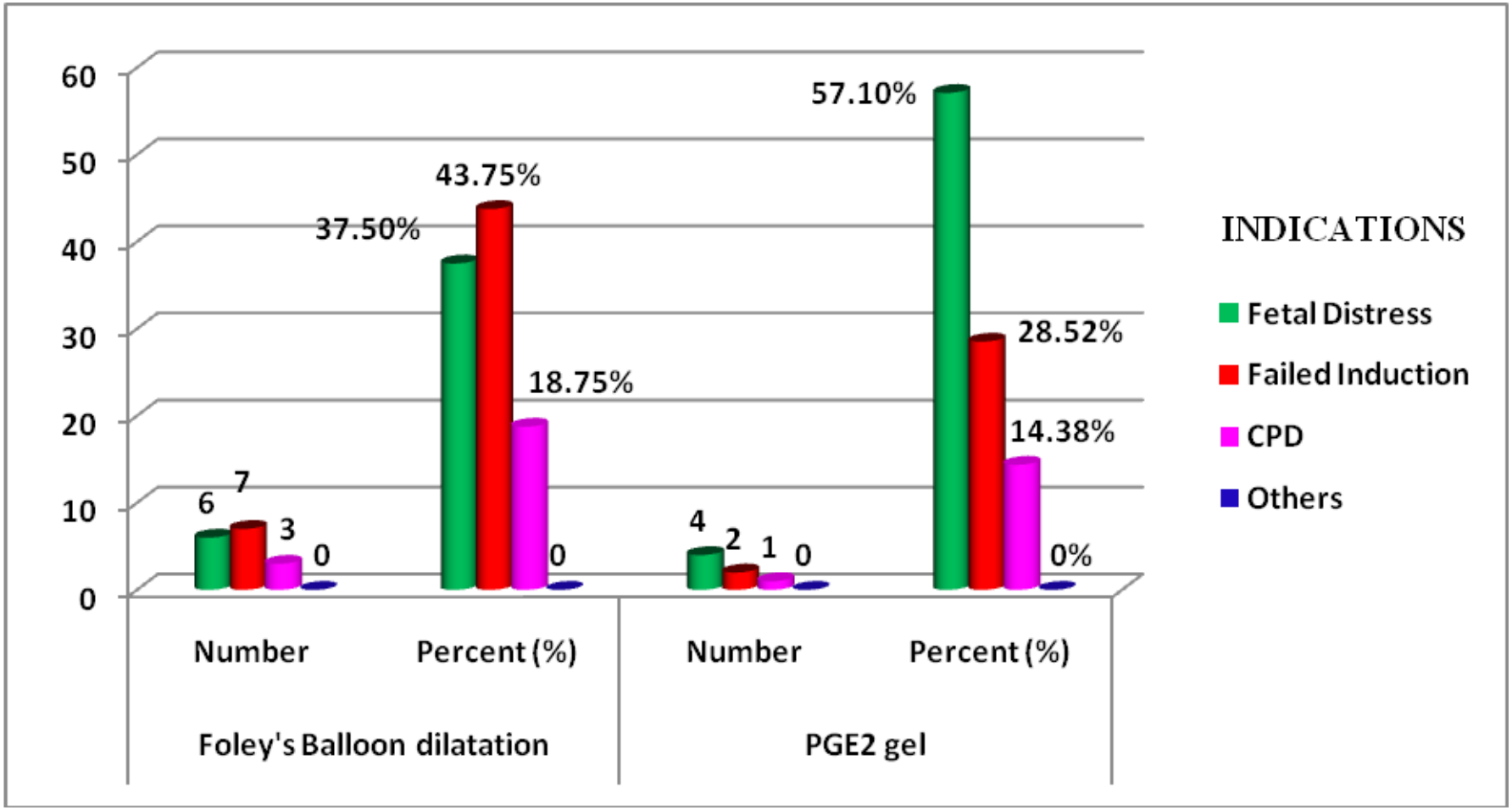

60
50
40
30
20
10
0
6
7
3
0
37.50%
43.75%
18.75%
0
4
2
1
0
57.10%
28.52%
14.38%
0%
Number
Percent (%)
Number
Percent (%)
Foley's Balloon dilatation
PGE2 gel
INDICATIONS
Fetal Distress
Failed Induction
CPD
Others

TABLE 17

FETAL OUTCOME

Admission in NICU	Foley's Balloon dilatation		PGE2 gel		Total
	Number	Percent (%)	Number	Percent (%)	
Yes	10	20	5	10	15
No	40	80	45	90	85
Total	50	100	50	100	100

P<0.05

20% of neonates in Foley's balloon dilatation group were admitted in neonatal intensive care unit, whereas only 10% of neonates in the PGE_2 gel regimen got admitted. The difference in the two groups is statistically significant using chi-square test.

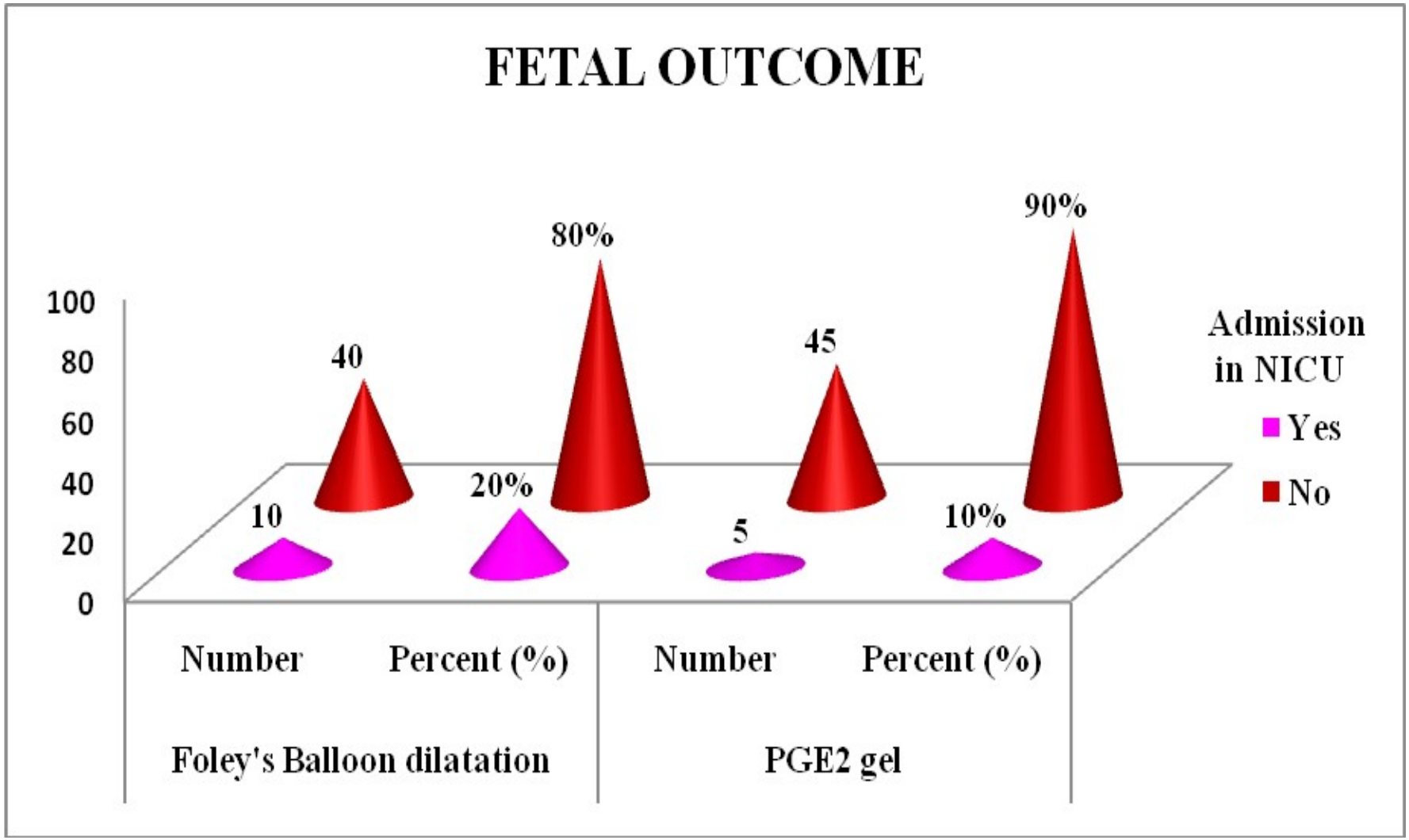
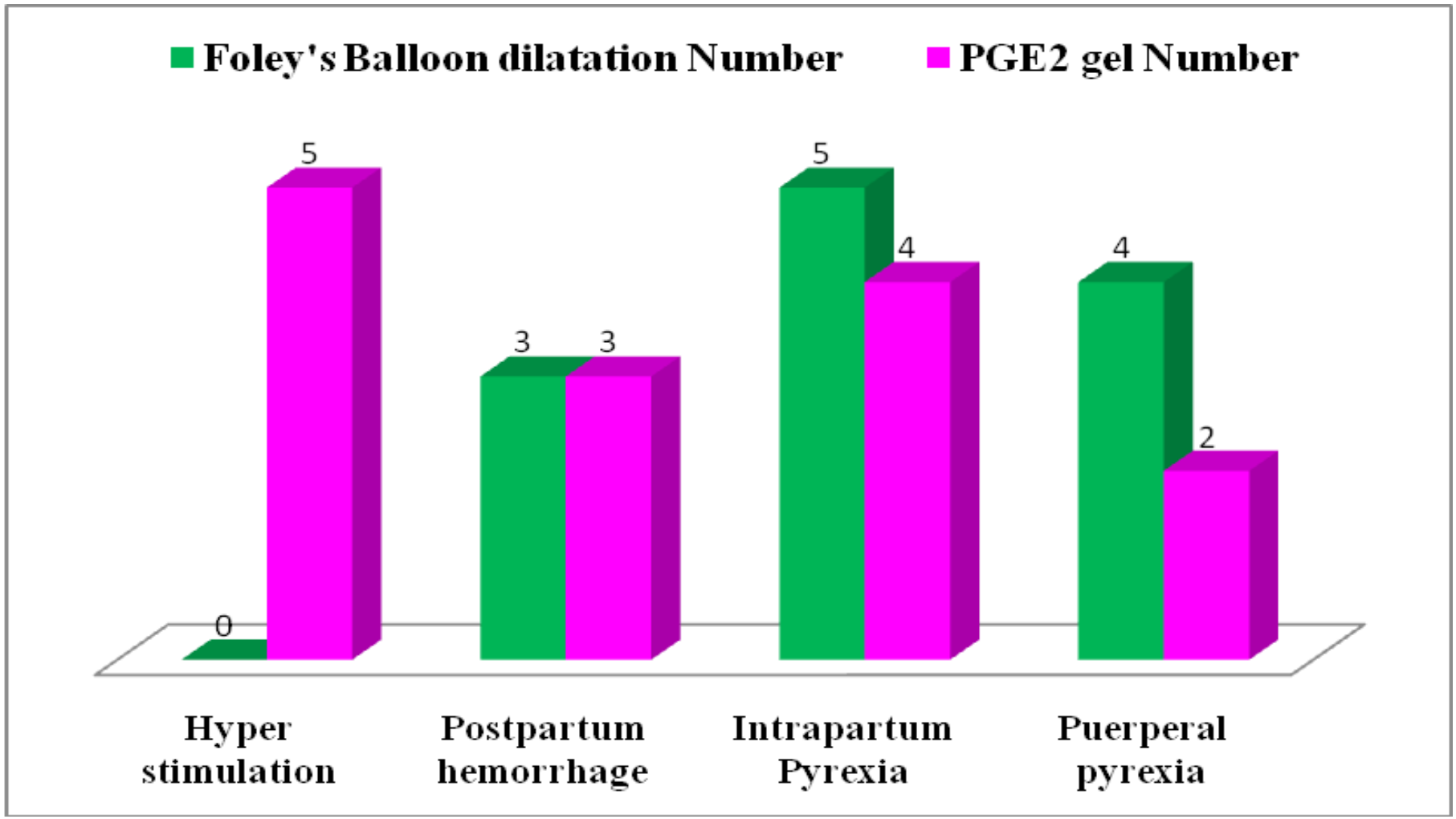

FETAL OUTCOME
100
80
60
40
20
0
40
80%
45
90%
10
20%
5
10%
Admission in NICU
Yes
No
Number
Percent (%)
Number
Percent (%)
Foley's Balloon dilatation
PGE2 gel

TABLE 18

MATERNAL COMPLICATIONS

	Foley's Balloon dilatation	PGE2 gel
	Number	Number
Hyper stimulation	-	5
Postpartum hemorrhage	3	3
Intrapartum Pyrexia	5	4
Puerperal pyrexia	4	2
Total	12	14

5 patients had hyper stimulation in the PGE_2 gel group. PPH incidence equal between two groups. Intrapartum and puerperal pyrexia slightly higher in Foley's group.


Foley's Balloon dilatation Number
PGE2 gel Number
0
5
3
3
5
4
4
2
Hyper stimulation
Postpartum hemorrhage
Intrapartum Pyrexia
Puerperal pyrexia

DISCUSSION

DISCUSSION

The study has been conducted at the Institute of Obstetrics and Gynaecology to assess the efficacy of Foley's intracervical ballon dilatation compared to prostaglandin E2gel for cervical ripening and induction of labour.

The study was carried out in 100 patients. Fifty patients being assigned randomnly to the balloon dilatation and 50 patients to PGE_2gel.

In this study, both Foley's balloon dilatation and PGE2 gel group had patients of almost similar age group, parity and gestational age. Maximum number of patients induced belonged to the 20 – 25 years age group. Studies by Janet B et al Feb 1999 showed the maximum number of patients belonged to 20 – 30 years of age group. Another study by Anderson et al in 1965 also showed that maximum number of cases belonged to the above age group.

Maximum number of patients in the study group were primigravida. Studies by Debra[3] A Guinn 2000 and Divya Rouben et al 1993 also had maximum number of women as primigravida.

In this study maximum number of patients induced between 37 – 40 weeks of gestation by PGE_2gel. In Foley's group equal distribution between 37 – 40 weeks and >40 weeks gestation.

The study of Divya Rouben[4] et al 1993 showing maximum patients induced at 40 – 42 weeks. In this study, postdatism was the commonest indication for induction in both groups. According to Janet et al and Divya Rouben, the commonest indication was postdatism, whereas according to Debra and Guinn[5], preeclampsia was the commonest indication.

Change in Bishop Score

Induction was started in both groups with similar Bishop Score. The mean Bishop Score at '0' hours in PGE_2 was in primis 2.11 when compared to the Foley's balloon dilatation group where it was 2.1.

The mean Bishop score at '0' hours in PGE2 gel group in multis was 2.71 when compared to the Foley's balloon dilatation group where it was 2.4.

The mean Bishop score at 6 hours in primis was 6.8 hrs in PGE2 gel group when compared to the Foley's balloon dilatation where the mean Bishop score at 6 hours was 5.7 hours. Similarly, the mean Bishop score at 12 hours was 9.33 hrs in primis in the PGE_2 group when compared to the Foley's balloon dilatation where the mean Bishop score at 12 hours was 8.2 hours.

The mean Bishop score at 6 hours in multis was 8.3 hrs in the PGE2 gel group when compared to the Foley's balloon dilatation where the mean Bishop score at 6 hrs was 6.7 hrs. Similarly, the mean Bishop score at 12 hrs in mutis was 10 hrs in the PGE_2 gel group when compared to the Foley's balloon

dilatation where the mean Bishop score was 9.8 hrs. Mean improvement in Bishop score was higher in the PGE_2 gel group when compared to the Foley's balloon dilatation.

According to a study by Taani et al[6] Royal Medical Services, change in mean Bishop score was significantly higher in the PGE2 gel group 3.09 versus catheter group 3.1, p value <0.01.

Induction to Active Labour interval

In PGE_2 gel group, 41% of primis established labour within 6 hours and 55% within 12 hours. Also 28% of multis within 6 hours and 71% of multis within 6 – 12 hours.

In Foley's balloon dilatation, 39% of primis established labour within 6 hours and 50% within 12 hours. Also 25% of multis established labour within 6 hours and 75% within 12 hours.

In PGE_2 group, only 2% crossed 12 hours to establish labour, whereas in the Foley's balloon dilatation, 10% crossed 12 hours to establish labour. All were primigravida.

The mean induction labour interval in primigravida in the PGE2 gel group was 6.5 hours. The mean induction to active labour interval in primigravida with Foley's balloon dilatation group was 7.5 hours.

The mean induction labour interval in multipara with PGE2 gel was 5.2 hours. The mean induction labour interval in multipara in the Foley's balloon dilatation group was 6.6 hours. The difference between the two groups is statistically significant.

PGE2 gel was found to be more effective in inducing labour when compared to Foley's balloon dilatation.

Induction to Delivery Interval

In PGE2 gel group, 61% of primis and 85% of multis delivered within 12 hours. In Foley's balloon dilatation, 47% of primis and 50% of multis delivered within 12 hours.

The mean induction delivery interval in primigravida with PGE_2 gel was 11.7 hours. The mean induction delivery interval in primigravida with Foley's balloon dilatation was 13 hours.

The mean induction to delivery interval in multipara with PGE_2 gel was 9.9 hours. The mean induction delivery interval in multipara with Foley's balloon dilatation was 13.4 hours. The difference between the two groups is statistically significant.

According to Taani et al[6] time from induction to delivery interval shorter in PGE2 gel compared to catheter group 42% delivered within 16 hours in catheter group and 61% delivered within 16 hours in PGE2 gel group.

Oxytocin augmentation

The need for oxytocin augmentation to deliver was higher with Foley's balloon dilatation when compared to the PGE_2 gel group. 78% of women in the Foley's balloon dilatation required oxytocin whereas only 36% of the PGE_2 gel required oxytocin.

According to studies by Taani et al[6], S.Chua et al, 49% required oxtocin in catheter group, whereas only 20% required oxytocin in the PGE2 gel group.

Mode of Delivery

Delivery by labour natural was higher in the PGE_2 gel group when compared to the Foley's balloon dilatation group.

Caesarean section rate was higher in the Foley's balloon dilatation group when compared with the PGE_2 gel group. 70% delivered by labour natural in PGE_2 gel group, 16% had forceps deliveries whereas in the Foley's balloon dilatation group only 56% had labour natural and 12% had forceps deliveries.

LSCS rate in Foley's balloon dilatation group was 32% when compared to the PGE_2 gel group where it was only 14%. The difference in the mode of delivery is statistically significant.

Indication for Caesarean Delivery

Fetal distress was the commonest indication for caesarean section in PGE_2 group whereas failed induction was the major indication for caesarean section in Foley's balloon dilatation group.

According to studies by Taani et al[6], fetal distress was more frequent in the catheter group.

Fetal Outcome

In the Foley's balloon dilatation group, 20% of neonates were admitted. The most common reason being respiratory distress.

In the PGE_2 gel group, 10% of neonates got admitted in neonatal intensive care unit due to birth asphyxia or meconium aspiration mainly due to the hyper stimulation which occurred in some women induced.

Maternal Complications

Intrapartum pyrexia and puerperal pyrexia were observed more in the Foley's balloon dilatation group due to prolonged labour whereas these complications were less in the PGE_2 gel group due to faster response to induction.

The incidence of postpartum hemorrhage was equal in both groups. Few were atonic which settled with uterotonic agents, other few were traumatic due to forceps deliveries which settled with suturing.

Hyperstimulation noted in 5 women who were induced with PGE_2 gel. They settled with changing them to left lateral position, plain fluids and nasal O_2. These delivered labour natural with babies in good condition and good maternal outcome.

SUMMARY

SUMMARY

a. Both PGE_2 gel group and Foley's balloon dilatation, induction was started with the same Bishop score of <5.
b. Both groups had majority of the women being primigravida.
c. Age group commonest in both groups being 20 – 24 years.
d. Improvement in Bishop score was more in the PGE_2 gel group when compared with the Foley's balloon dilatation group P value <0.05.
e. Mean induction to labour interval was shorter in the PGE_2 gel when compared to the Foley's balloon dilatation group P value <0.05.
f. Mean induction to delivery interval was also shorter in the PGE_2 gel group when compared with Foley's balloon dilatation. P value <0.05.
g. Mean induction to labour interval and mean induction to delivery interval were shorter in multis compared to primis in both groups of PGE_2 gel and Foley's balloon dilatation.
h. Oxytocin for augmentation was higher in the Foley's balloon dilatation around 78% whereas the rate of usage of oxytocin for augmentation in the PGE_2 gel group was 36%.
i. Mode of delivery being labour natural 76% for patients in the PGE_2 gel group where it was only 56% in the Foley's balloon dilatation group.

j. Including the forceps deliveries, most patients in the PGE_2 gel group delivered vaginally.

k. Caesarean section rate in Foley's balloon dilatation was higher 32% whereas it was only 14% in the PGE_2 gel group.

l. Incidence of caesarean for the indication of failed induction was higher in the Foley's balloon dilatation group.

m. Neonates admitted in neonatal intensive care unit were more in the Foley's balloon dilatation group.

n. Hyper stimulation was more in the PGE_2 gel group whereas intrapartum and puerperal pyrexia were higher in the Foley's balloon dilatation group.

o. PGE_2 gel was found to be more effective method of cervical ripening and induction of labour.

CONCLUSION

CONCLUSION

- Cervical ripening more effective with prostaglandin E_2 gel application.
- Mean induction to active labour interval and mean induction to delivery interval were shorter with prostaglandin E_2 gel instillation.
- Oxytocin augmentation was less with prostaglandin E_2 gel instillation.
- Response of multis in both groups better than primis.
- Fetal and maternal outcome were better with prostaglandin E_2 gel.
- From this study, it is known that prostaglandin E_2 gel is a better and more effective agent than Foley's balloon dilatation in cervical ripening and induction of labour.

ANNEXURE

- ❖BIBLIOGRAPHY
- ❖PROFORMA
- ❖MASTER CHART
- ❖ABBREVIATIONS

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PROFORMA

Name	:		Age :
I.P. No.	:		Unit :
SOCIOECONOMIC STATUS	:	Booked :	Yes / No
MENSTRUAL HISTORY	:	Regular / Irregular	
		LMP	EDD
MARITAL HISTROY	:	Married / Unmarried	
OBSTETRIC HISTORY	:	G ☐ P ☐ A ☐	
		Still Birth / Neonatal death	
		LCB	
PRESENT PREGNANCY	:	Confirmed by : HCG	
	:	Bimanual	
	:	USG	

PERSONAL HISTORY

Smoker :

Alcoholic :

Mixed diet :

PREVIOUS OBSTETRIC HISTORY

H/o Postdatism

PIH

GENERAL EXAMINATION :

Height :

Weight :

Anemia : Yes / No

Febrile : Yes / No

Edema : Yes / No

Temperature : CVS : RS :

OBSTETRIC EXAMINATION

Per Abdomen : Uterus size <37 weeks
Term

Acting / Not acting

Presentation : Cephalic

Presenting Part : Unengaged / Mobile

PELVIC EXAMINATION

Cervical Effacement : 0 ☐ 25 ☐ 50 – 75 ☐ ☐

100 ☐ ☐ ☐

Position : Anterior Middle Posterior

Consistency : Firm ☐ Medium ☐ Soft ☐

Dilatation : 0 ☐ 1 – 2 ☐ 3 – 4 ☐ 5 – 6 ☐

Station : –3 ☐ –2 ☐ –1, 0 ☐ +1 ☐

BISHOP SCORE

0 Hours ☐ 6 Hours ☐ 12 Hours ☐ 18 Hours ☐

INVESTIGATIONS

Urine : Albumin ☐ Sugar ☐ Deposit ☐

CTG : Reactive ☐ Non Reactive ☐

USG : Singleton ☐ Multiple ☐

Vertex ☐ Non Vertex ☐

GA : <40 ☐ 40 – 41 ☐ 41 – 42 ☐

AFI : <5 ☐ 5 – 10 ☐ >10 ☐

Placenta : FH

INDICATION FOR INDUCTION

- Postdated
- Preeclampsia
- IUGR
- Oligohydramnios

MODE OF INDUCTION

Prostaglandin E2 Gel : ☐

Intracervical Foley's catheter : ☐

Oxytocin : Used ☐ Not used ☐

WHETHER REINSTILLATION

With Dinoprostone Gel Needed : Yes ☐ No ☐

INDUCTION TO ACTIVE LABOUR INTERVAL

INDUCTION TO DELIVERY INTERVAL

MONITORING INTRAPARTUM MATERNAL AND FETAL CONDITIONS

MATERNAL: Temperature ☐ PR ☐ BP ☐ Hydration ☐

FETAL: FHR ☐ Meconium ☐

MODE OF DELIVERY

Labour Natural : ☐

Forceps : ☐

Vacuum : ☐

LSCS : ☐

INDICATION FOR LSCS

Failed Induction : ☐

Fetal Distress : ☐

CPD : ☐

Others : ☐

COMPLICATIONS DURING LABOUR

BABY DETAILS

Weight : ☐ Sex : ☐

APGAR : 1 Min ☐ 5 Min ☐

Admission : Yes / No ☐

Preterm / Term /AGA / SGA / IUGR

COMPLICATIONS

MATERNAL

- Intrapartum –Maternal Distress : Yes / No

  PPH : Yes / No

  Pyrexia : Yes / No

- Postpartum – Episiotomy wound : Yes / No

  Sepsis : Yes / No

  Pyrexia : Yes / No

MASTER CHART
PROSTAGLANDIN E2gel

S.No.	Name	IP No.	Age	Gravida	Uterine Size (Weeks)	Indication for Induction	Bishop Score 0 hrs	Bishop Score 6 hrs	Bishop Score 12 hrs	Bishop Score 18 hrs	Mode of Induction	Whether reinstilled
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Anjalai	8936	21	Primi	40	Postdated	3	8	-	-	Dinoprostone	No
2	Selvarani	12534	22	Primi	40	Postdated	2	5	8		Dinoprostone	No
3	Reeja	12821	29	G2P1L1	40	Postdated	3	9	-	-	Dinoprostone	-
4	Maheshwari	12838	23	Primi	38	Pre-eclampsia	2	6	-	-	Dinoprostone	Yes
5	Karpagam	12842	22	G2P1L1	41	Postdated	3	10	-	-	Dinoprostone	-
6	Chitra	12910	26	Primi	41	Postdated	1	5	11	-	Dinoprostone	Yes
7	Gowri	9940	20	Primi	40	Postdated	3	10	-	-	Dinoprostone	-
8	Sumathy	9856	22	Primi	41	Postdated	2	7	-	-	Dinoprostone	-
9	Fathima	9948	27	Primi	42	Postdated	3	8	-	-	Dinoprostone	No
10	Kanchana	11251	27	G3P2L2	40	Pre-eclampsia	3	8	-	-	Dinoprostone	-
11	Ambika	11262	32	Primi	40	I U G R	4	9	-	-	Dinoprostone	-
12	Mumtaj	11264	18	Primi	40	Postdated	3	8	-	-	Dinoprostone	-
13	Banu	11278	19	Primi	38	Pre-eclampsia	3	8	-	-	Dinoprostone	-
14	Maragatham	11354	23	G3P2L1	40	Pre-eclampsia	3	10	-	-	Dinoprostone	-
15	Sivasankari	11348	30	Primi	40	Postdated	1	4	8	-	Dinoprostone	Yes
16	Susheela	11365	29	Primi	40	Pre-eclampsia	1	7	-	-	Dinoprostone	-
17	Panjalai	11420	21	Primi	41	Postdated	2	8	-	-	Dinoprostone	-
18	Jacqueles	11425	21	Primi	40	Postdated	2	5	-	-	Dinoprostone	Yes
19	Revathy	11438	18	Primi	40	Postdated	3	8	10	-	Dinoprostone	Yes
20	Subbulakshmi	11450	25	Primi	40	I U G R	1	6	9	12	Dinoprostone	Yes
21	Porkodi	12342	25	G3P2L1	40	Oligohydramnios	3	8	-	-	Dinoprostone	-
22	Kamatchi	12346	28	G3P2L1	40	Postdated	3	9	-	-	Dinoprostone	-
23	Petrisha	12354	27	Primi	41	Postdated	4	10	-	-	Dinoprostone	-
24	Krishnaveni	12548	28	G4P2L1A1	40	Pre-eclampsia	3	8	12	-	Dinoprostone	-
25	Saradevi	12460	27	Primi	40	Postdated	1	8	11	-	Dinoprostone	-

S.No.	Oxytocin	Induction Labour interval (hrs)	Induction Delivery interval (hrs)	Method of Delivery	Indication C/S	Neonatal outcome	Intrapartum Maternal Distress	I.P. PPH	I.P. Pyrexia	Episiotomy wound Sepsis	Pyrexia
1	14	15	16	17	18	19	20	21	22	23	24
1	Yes	4	8	Labour natural	-	Good	-	-	-	-	-
2	Yes	6	11	Labour natural	-	Good	-	-	-	-	-
3	-	4	7	Labour natural	-	Good	-	-	-	-	-
4	-	7	11	Forceps	-	adm	-	Yes	-	-	-
5	-	4.5	9	Labour natural	-	Good	-	-	-	-	-
6	Yes	7	13	Forceps	-	Good	Yes	-	-	-	-
7	-	4	7.5	Labour natural	-	Good	-	-	-	-	-
8	-	4	8	Labour natural	-	Good	-	-	-	-	-
9	-	6	8	LSCS	Fetal distress	adm	-	-	Yes	-	-
10	-	4	7	Labour natural	-	Good	-	-	-	-	-
11	Yes	6	10	Labour natural	-	Good	-	-	-	-	-
12	-	5.5	7	Labour natural	-	Good	-	-	-	-	-
13	-	4	8	Labour natural	-	adm	-	-	-	-	-
14	-	5	7	Labour natural	-	Good	-	-	-	-	-
15	Yes	8	14	Forceps	-	Good	Yes	-	-	-	-
16	-	6.5	8.5	Labour natural	-	Good	-	-	Yes	-	-
17	-	6	11	Labour natural	-	Good	-	-	-	-	-
18	Yes	6	7	LSCS	Failed induction	Good	-	-	-	-	-
19	Yes	5.5	13	Labour natural	-	Good	-	-	-	-	-
20	Yes	7.5	18	LSCS	Fetal distress	adm	-	-	-	-	-
21	-	5	9.5	Labour natural	-	Good	-	-	-	-	-
22	-	5.5	11	Labour natural	-	Good	-	-	-	-	-
23	-	3.5	8	Labour natural	-	Good	-	-	-	-	-
24	-	5.5	12	Labour natural	-	Good	-	-	-	-	-
25	-	5	13	Labour natural	-	Good	-	-	-	-	-

S.No.	Name	IP No.	Age	Gravida	Uterine Size (Weeks)	Indication for Induction	Bishop Score 0 hrs	Bishop Score 6 hrs	Bishop Score 12 hrs	Bishop Score 18 hrs	Mode of Induction	Whether reinstilled
26	Jeya	12652	22	Primi	40	Postdated	2	6	8	-	Dinoprostone	-
27	Hemavathy	12664	24	G2P1L1	41	Postdated	2	10	-	-	Dinoprostone	-
28	Lakshmi	12722	23	G3P2L2	40	Pre-eclampsia	2	7	-	-	Dinoprostone	-
29	Suryakala	12734	27	G2P1L1	41	Postdated	4	10	-	-	Dinoprostone	-
30	Sethalakshmi	12736	28	G2P1L1	40	Oligohydramnios	3	9	-	-	Dinoprostone	-

31	Akilandam	12842	22	Primi	40	Postdated	3	8	-	-	Dinoprostone	-
32	Devi	12954	22	Primi	40	Postdated	2	8	11	-	Dinoprostone	Yes
33	Sudha	13120	28	Primi	38	Oligohydramnios	1	5	8	-	Dinoprostone	Yes
34	Annapoorani	13124	23	Primi	40	Postdated	1	5	12	-	Dinoprostone	Yes
35	Esther	13228	21	Primi	40	Postdated	2	5	7	10	Dinoprostone	Yes
36	Sulochana	13324	30	Primi	40	I U G R	2	4	8	13	Dinoprostone	-
37	Kumudha	13421	22	Primi	41	Postdated	2	8	-	-	Dinoprostone	-
38	Sahira	13524	21	Primi	40	Pre-eclampsia	2	5	8	-	Dinoprostone	Yes
39	Gajalakshmi	13628	18	Primi	40	Postdated	3	8	-	-	Dinoprostone	-
40	Nalini	13640	24	Primi	41	Postdated	2	5	9	12	Dinoprostone	Yes
41	Anjugam	13722	18	Primi	40	Pre-eclampsia	2	8	12	-	Dinoprostone	-
42	Geetha	13685	24	G2P1L1	40	Postdated	2	5	9	-	Dinoprostone	Yes
43	Kasthuri	13276	21	Primi	41	Postdated	2	7	11	-	Dinoprostone	-
44	Malar	13323	23	Primi	41	Postdated	2	7	10	-	Dinoprostone	-
45	Anandhi	13450	18	G2P1L1	40	Pre-eclampsia	2	5	9	11	Dinoprostone	Yes
46	Ramani	13582	24	Primi	38	Oligohydramnios	2	4	10	-	Dinoprostone	-
47	Rajinamary	14210	22	Primi	40	I U G R	2	6	9	-	Dinoprostone	-
48	Saraswathi	13819	24	G5P2L2A1	41	Postdated	2	9	-	-	Dinoprostone	-
49	Sumithra	13920	25	Primi	41	Postdated	2	6	11	-	Dinoprostone	-
50	Lakshmi	13925	20	Primi	40	Postdated	3	8	11	-	Dinoprostone	-

S.No.	Oxytocin	Induction Labour interval (hrs)	Induction Delivery interval (hrs)	Method of Delivery	Indication C/S	Neonatal outcome	Intrapartum Maternal Distress	I.P. PPH	I.P. Pyrexia	Episiotomy wound Sepsis	Pyrexia
1	14	15	16	17	18	19	20	21	22	23	24
26	Yes	12	13	Forceps	-	Good	-	-	-	-	-
27	-	4	9	Labour natural	-	Good	-	-	-	-	-
28	-	4	8	Labour natural	-	Good	Yes	-	-	-	-
29	-	4.5	8	Labour natural	-	Good	-	-	-	-	-

30	Yes	6	9	Labour natural	-	Good	-	-	-	-	-
31	Yes	4.5	9	Labour natural	-	Good	-	-	-	-	-
32	Yes	5	13	Labour natural	-	Good	-	-	-	-	-
33	Yes	6	14	Forceps	-	Good	-	-	Yes	Yes	-
34	Yes	12	14	Forceps	-	Good	-	-	-	-	-
35	Yes	10	18	LSCS	Failed induction	Good	-	-	-	-	-
36	-	7	12	Labour natural	-	Good	-	-	-	-	-
37	-	6	11	Labour natural	-	Good	-	-	-	-	-
38	Yes	8.5	13	Forceps	-	adm	Yes	-	-	-	-
39	-	5	11	Forceps	-	Good	-	-	-	-	-
40	Yes	13	18	Labour natural	-	Good	-	-	-	-	-
41	Yes	5	12	Labour natural	-	Good	-	-	-	-	-
42	No	7.5	13.5	L S C S	Fetal distress	Good	-	-	-	-	-
43	No	5.5	12	Labour natural	-	Good	-	-	-	-	-
44	-	5.5	11	Labour natural	-	Good	-	-	-	-	-
45	Yes	7.5	19	Labour natural	-	Good	-	-	-	-	-
46	-	10	19	L S C S	Fetal distress	Good	-	-	-	-	-
47	Yes	7	13	LSCS	Failed induction	Good	-	-	-	-	-
48	-	6	9	Labour natural	-	Good	-	-	-	-	-
49	-	5.5	12	Labour natural	-	Good	-	-	-	-	-
50	-	6	11	Labour natural	-	Good	-	-	-	-	-

MASTER CHART
FOLEY's CATHETER

S.No.	Name	IP No.	Age	Gravida	Uterine Size (Weeks)	Indication for Induction	Bishop Score 0 hrs	Bishop Score 6 hrs	Bishop Score 12 hrs	Bishop Score 18 hrs	Mode of Induction	reinstilledWhether
1	2	3	4	5	6	7	8	9	10	11	12	13
1	Mythili	10420	27	G3P2L2	37	Pre-eclampsia	2	6	11	-	Foley's	-
2	Marthal	10526	26	Primi	41	Postdated	1	4	7	-	Foley's	Yes

3	Bhuvaneswari	10530	22	G2P1L1	41	Postdated	3	8	10	-	Foley's	-
4	Abirami	10532	20	G2P2L1	41	Postdated	2	7	10	-	Foley's	-
5	Bharathy	10644	22	Primi	41	Pre-eclampsia	4	8	12	-	Foley's	-
6	Saridha	10667	20	G2P1L1	40	Postdated	3	8	11	-	Foley's	-
7	Malarvizhi	10642	20	G3A2	40	Postdated	3	6	8	10	Foley's	Yes
8	Aameena	10654	24	Primi	41	Postdated	2	6	7	11	Foley's	Yes
9	Lidiya	10720	25	Primi	40	Postdated	2	6	9	-	Foley's	Yes
10	Sahithabegum	10732	24	G3P1L1A1	40	I U G R	2	7	10	-	Foley's	-
11	Ponni	10741	22	Primi	41	Postdated	0	4	7	12	Foley's	Yes
12	Gnanambigai	11748	24	G2P1L1	37	Oligohydramnios	2	6	10	-	Foley's	-
13	Kannagi	11824	33	G3P1L1A1	41	Postdated	2	7	9	-	Foley's	-
14	Reshnia	11842	22	Primi	41	Postdated	2	7	9	-	Foley's	-
15	Sujatha	11854	20	Primi	41	Postdated	3	4	7	-	Foley's	Yes
16	Sundari	11862	24	Primi	41	Postdated	1	3	3	-	Foley's	Yes
17	Reginamary	11878	22	Primi	40	Postdated	2	6	9	-	Foley's	-
18	Rameshwari	11940	24	Primi	40	Pre-eclampsia	1	5	10	-	Foley's	Yes
19	Sumithra	11843	25	Primi	41	Postdated	3	6	11	-	Foley's	-
20	Usha	11524	27	Primi	42	Postdated	3	4	5	-	Foley's	Yes
21	Padmavathy	11548	23	Primi	41	Postdated	2	7	10	-	Foley's	-
22	Sujana	11643	20	Primi	41	Postdated	2	3	3	-	Foley's	Yes
23	Veeramani	11724	20	Primi	40	Postdated	3	4	7	10	Foley's	Yes
24	Ambiga	11740	23	Primi	40	Pre-eclampsia	2	6	9	-	Foley's	-

S.No.	Oxytocin	Induction Labour interval (hrs)	Induction Delivery interval (hrs)	Method of Delivery	Indication C/S	Neonatal outcome	Intrapartum Maternal Distress	I.P. PPH	I.P. Pyrexia	Episiotomy wound Sepsis	Pyrexia

1	14	15	16	17	18	19	20	21	22	23	24
1		7.5	12	Labour natural	-	Good	-	-	-	-	-
2		8	13	Forceps	-	Good	-	-	-	-	-
3		5.5	12	Labour natural	-	Good	-	-	-	-	-
4		6	14	Labour natural	-	Good	-	-	-	-	-
5	Yes	8	20	Labour natural	-	adm	-	-	-	-	-
6		5.5	12	Labour natural	-	Good	-	-	-	-	-
7		8	12	Forceps	-	Good	-	-	-	-	-
8		7.5	14	Labour natural	-	adm	-	-	-	-	-
9	Yes	7	13	LSCS	CPD	Good	-	-	-	-	-
10	Yes	6	14	Labour natural	-	Good	-	-	-	-	-
11	Yes	13	19	LSCS	CPD	adm	-	-	-	-	-
12	Yes	7.5	12	Labour natural	-	Good	-	-	-	-	-
13	Yes	6	14	Labour natural	-	Good	-	-	-	-	-
14	Yes	6	12	Labour natural	-	Good	-	-	-	-	-
15	Yes	8	14	LSCS	Fetal distress	adm	-	-	-	-	-
16		10	12	LSCS	Fetal distress	Good	-	-	-	-	-
17	Yes	7	13	LSCS	Failed Induction	Good	-	-	-	-	-
18	Yes	8.5	11.5	Forceps	-	Good	-	-	-	-	-
19	Yes	5.5	12	Labour natural	-	Good	-	-	-	-	-
20	Yes	-	13	LSCS	Failed Induction	Good	-	-	-	-	-
21	Yes	5.5	11	Labour natural	-	Good	-	-	-	-	-
22		-	13.5	LSCS	Failed Induction	adm	-	-	-	-	-

23	Yes	10	19	LSCS	Failed Induction	adm	-	-	-	Yes	-
24	Yes	7	13	Labour natural	-	Good	-	-	-	-	-

S.No.	Name	IP No.	Age	Gravida	Uterine Size (Weeks)	Indication for Induction	Bishop Score 0 hrs	Bishop Score 6 hrs	Bishop Score 12 hrs	Bishop Score 18 hrs	Mode of Induction	reinstilledWhether

1	2	3	4	5	6	7	8	9	10	11	12	13
25	Kokila	11824	21	Primi	41	Postdated	1	5	10	-	Foley's	Yes
26	Shanthi	11845	30	Primi	41	Postdated	2	7	9	-	Foley's	-
27	Ramani	12241	25	Primi	41	Postdated	2	7	10	-	Foley's	-
28	Sofia	12342	21	Primi	38	Oligohydramnios	2	6	9	-	Foley's	-
29	Vijaya	12454	21	G2P1L1	41	Postdated	2	6	9	11	Foley's	-
30	Amul	12528	22	Primi	41	Postdated	3	6	7	11	Foley's	-
31	Mariammal	12532	22	G2P1L1	40	Postdated	2	5	9	11	Foley's	-
32	Meherjani	12544	28	G2P1L1	38	Pre-eclampsia	3	8	12	-	Foley's	-
33	Inbarani	12546	22	Primi	41	Postdated	3	6	8	-	Foley's	-
34	Rekha	13154	20	Primi	41	Postdated	2	7	11	-	Foley's	-
35	Varalakshmi	13186	27	Primi	40	I U G R	2	4	8	-	Foley's	Yes
36	Gayathri	13242	22	Primi	40	Postdated	1	4	5	-	Foley's	Yes
37	Vasuki	13229	22	Primi	41	Postdated	2	7	11	-	Foley's	-
38	Vimala	13244	20	Primi	41	Postdated	1	3	3	-	Foley's	-
39	Anandhi	13543	18	G2A1	40	Postdated	2	5	9	11	Foley's	Yes
40	Geetha	14260	24	G2P1L1	40	Postdated	2	5	9	-	Foley's	-
41	Indira	13829	23	Primi	38	Pre-eclampsia	2	4	5	-	Foley's	Yes
42	Kasthuri	13648	21	Primi	40	Postdated	2	7	11	-	Foley's	-
43	Mangala	13313	19	Primi	41	Postdated	1	4	9	-	Foley's	Yes
44	Ajantha	13429	22	Primi	41	Postdated	3	6	8	-	Foley's	-
45	Padmini	13526	25	Primi	40	Pre-eclampsia	2	7	11	-	Foley's	Yes
46	Aria	13614	19	Primi	40	Postdated	3	8	-	-	Foley's	-
47	Kalpana	13596	25	Primi	41	Postdated	1	6	9	-	Foley's	Yes
48	Nagammal	12985	30	Primi	40	I U G R	3	9	-	-	Foley's	-
49	Banu	13425	23	G2P1L1	40	Postdated	3	10	-	-	Foley's	-
50	Yasodha	14210	24	Primi	40	Postdated	3	10	-	-	Foley's	-

S.No.
Oxytocin
Induction Labour interval (hrs)
Induction Delivery interval (hrs)
Method of Delivery
Indication C/S
Neonatal outcome
Intrapartum Maternal Distress
I.P. PPH
I.P. Pyrexia
Episiotomy wound Sepsis
Pyrexia

1	14	15	16	17	18	19	20	21	22	23	24
25		8.5	11.5	Labour natural	-	Good	-	-	-	-	Yes
26	Yes	6.5	12	Labour natural	-	Good	-	-	-	-	-
27	Yes	5.5	11	Labour natural	-	Good	-	-	-	-	-
28	Yes	7	13	LSCS	Fetal distress	adm	-	-	-	-	-
29	Yes	7.5	14	Labour natural	-	Good	-	-	-	-	-
30	Yes	13	20	LSCS	Fetal distress	Good	-	-	-	-	Yes
31	Yes	7.5	19	Labour natural	-	Good	-	Yes	-	-	-
32	Yes	6	12	Labour natural	-	Good	-	Yes	-	-	-
33	Yes	13	20	LSCS	Fetal distress	Good	-	-	-	-	-
34	Yes	5.5	13	Labour natural	-	Good	-	-	-	-	-
35	Yes	11	13	LSCS	Fetal distress	Good	-	-	-	-	-
36	Yes	9	9	LSCS	CPD	Good	-	-	-	-	-
37	Yes	5.5	12	Labour natural	-	Good	-	-	-	-	-
38	Yes	-	9	LSCS	Failed Induction	adm	-	-	Yes	-	-
39	Yes	7.5	19	Forceps	-	Good	-	Yes	-	Yes	-
40	Yes	7.5	13.5	Forceps	-	Good	-	-	-	-	-
41	Yes	-	13	LSCS	Failed Induction	Good	-	-	-	-	-
42	Yes	5.5	12	Labour natural	-	Good	-	-	-	-	-
43		8.5	13.5	LSCS	Failed Induction	adm	-	-	-	-	-
44	Yes	9	10	Forceps	-	adm	-	-	-	-	-
45	Yes	5.5	11	Labour natural	-	Good	-	-	-	-	-
46	Yes	4	7.5	Labour natural	-	Good	-	-	-	-	-
47	Yes	5	14	Labour natural	-	Good	-	-	-	-	-
48	Yes	5	10	Labour natural	-	Good	-	-	-	-	-

49	Yes	4.5	8.5	Labour natural	-	Good	-	-	-	-	-
50	Yes	4	10	Labour natural	-	Good	-	-	-	-	-

ABBREVIATIONS

GDM	:	Gestational Diabetes Mellitus
PROM	:	Prelabour rupture of membranes
ATP	:	Adenosine triphosphate
HIV	:	Human Immuno Deficiency virus
IUGR	:	Intrauterine growth restriction
CPD	:	Cephalo pelvic disproportion
NICU	:	Neonatal intensive care unit
LCB	:	Last child birth
LMP	:	Last Menstrual Period
EDD	:	Expected date of delivery
HCG	:	Human chorionic gonadotrophin
USG	:	Ultrasonogram
PIH	:	Pregnancy induced hypertension
LSCS	:	Lower Segment Caesarean Section
PPH	:	Post partum hemorrhage
Primi	:	Primigravida
G	:	Gravida
P	:	Para
L	:	Live birth
A	:	Abortion
C/S	:	Caesarean section.